

# Boiling Water in a Paper Cup



## ***Introduction***

We usually boil water in a metal pan or ceramic dish because they don't burn. Of course, paper burns when it comes in contact with a flame. So, is it possible to boil water in a paper cup using an open flame?

## ***Materials***

paper cup(s)

## ***Equipment***

beaker

Bunsen burner or candle

ring stand

utility clamp or small iron ring

## ***Safety Considerations***

- Be careful not to burn yourself with the open flame, hot water, or any hot equipment.
- Sometimes chemicals from previous labs still remain in glassware and on other lab equipment; wash all lab equipment before and after performing this lab.
- Wash your hands thoroughly after completing this lab.

## ***Procedure***

1. Assemble the ring stand and utility clamp (or small iron ring) so that the Bunsen burner (or candle) is about 2-3 inches away from the clamp.
2. Place a paper cup in the clamp and carefully fill it with tap water using a beaker. Make sure that the cup is filled to the very top but not overflowing.
3. Gently heat the bottom of the paper cup with the Bunsen burner using a low flame, slowly moving it back and forth so that it doesn't burn the cup.
4. Continue to heat the water until small bubbles have formed at the bottom.

## ***Clean-up***

1. Dump the tap water down the sink.
2. Throw the paper cup away.
3. Return all equipment to its proper location.
4. Wipe down your lab area.
5. Wash your hands before leaving the lab.

**Questions**

1. Look carefully at the cup after the water has cooled. What do you observe?

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2. How is it possible that a paper cup full of water did not burn?

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3. If you heat water in a glass container, like a beaker, the glass will get hotter than the water. In this lab, the paper did not get very hot. Why do you think it didn't get hot?

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4. In an episode of the reality TV show *Survivorman*, the host sterilizes muddy water he found in the African desert by carefully boiling it in a plastic water bottle. Why do you think this might be difficult to repeat using a plastic cup?

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5. List one way you could change this lab and describe how your results might be different.

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