

Jia Mohan
Research Plan

Which water bottle keeps water the hottest for the longest time for the best price? My water gets lukewarm or cold quickly during the winter season. I want to find a water bottle that I can put a hot drink into which will keep it hot-warm throughout the day but is not too expensive. Some water bottles are good for insulation but everyone doesn't have access to them because of the prices. I believe that the Yeti Tumbler will keep my drink the warmest for the longest time. Many water bottles are vacuum insulated including Hydroflasks, Stanley's, and Yeti's. Vacuum Insulation is where a small gap of air is set in between the bottle's inner walls which reduces conduction and keeps the drink hot or cold for a long time. This also keeps the outside of the water bottle from becoming wet and creating marks. Heat travels through air very easily so insulation is necessary to keep the drink at the same temperature. Some water bottles still use a plastic coating or layer because it lowers the amount of heat transfer. Yeti's are known to keep drinks cold or hot for a very long time and this tumbler is double-vacuum sealed unlike Stanley's and Hydroflasks which only have one vacuum seal. I will take three of the most popular water bottles, a Stanley Quencher, a Yeti Tumbler, and a Hydroflask, and see which one keeps my water the warmest for the longest amount of time.

Procedure:

- Put 4 cups of boiling water into each bottle at an interval of 10 minutes.
- Set a timer for 2 hrs
- After 2 hours check the temperature
- Record any temperature changes in a table
- Continue for 12 hours, measuring and recording every 2 hrs
- Repeat the whole process twice.

Data Analysis

- Record the temperature of the 2hr intervals in a table
- Calculate the average time at the 2hr intervals for each bottle
- Graph the results plotting the hours and the temperature
- Analyze the graph

Whichever water bottle temperature dropped the least will be named the most insulated. I will research the price of the water bottles and analyze if this is reflected in the results.

PRICES:

Stanley: \$45

Hydroflask: \$31.47

Yeti: 38

Sources:

[9 Best Water Bottle Options for Everywhere and Anywhere Sipping | Architectural Digest](#)
[Flask Insulation Test](#)
[Stanley Vs. Yeti Tumblers: Our Tested Review](#)
[YETI Rambler 36 Review | Insulated Bottle Review | Backpackers.com](#)
[Research Plan Outline | Mercer Science and Engineering Fair](#)

[Will a Drink Stay Colder for Longer in a Container Made of Plastic or Metal?](#)
[The best-insulated water bottles of 2024 | Popular Science](#)