



The Thin Ice

M3-12 PHYSICS



Question

What liquid melts ice the fastest?

Abstract

The purpose of my experiment is to determine what liquid melts ice the fastest. The rationale behind this project is that our current method for melting ice in public places, salt, can have detrimental effects on wildlife, infrastructure, and soil. This project aims to see if there are any other, more environmentally friendly ways of melting ice.

My hypothesis for this experiment is that if ice is put into a variety of liquids, then the salt water will melt the ice the fastest, because the salt will disrupt an equilibrium with the water and the ice and cause the ice to melt at a faster rate.

Hypothesis

If ice is placed into different liquids, then the salt water will melt the ice the fastest, because it is less dense than the other liquids and the salt will stop any more water from freezing.

Materials

20 cups

4 liters of Water

200 mg of Salt

200 mg of Sugar

4 liters of Milk

4 liters of Orange juice

Thermometer

Stopwatch

Procedure

1. Gather Materials
2. Go to designated testing location (Must have constant temperature)
3. Set temperature to 80 degrees Fahrenheit
4. Lay out 5 cups
5. Fill 3 cups with 200 ml of water each, then fill the other two cups with 200 ml of orange juice and 200 ml of milk
6. Put 5 mg of salt into one of the cups of water and stir well, be sure to label it
7. Put 5 mg of sugar into a different cup of water, stir well
8. Find the temperature for each liquid, they should all be at 50 degrees Fahrenheit
9. If any of the liquids are not at this temperature, then either cool or warm them to the required temperature
10. Put ice into each cup, make sure that each ice cube is the same size
11. Record the time it takes for each ice cube to melt completely
12. Empty the liquids
13. Repeat 19 times
14. Average the times for each liquid

Procedure

Independent Variable - Liquid

Dependent Variable - Time until ice cube melts completely

Control - Water

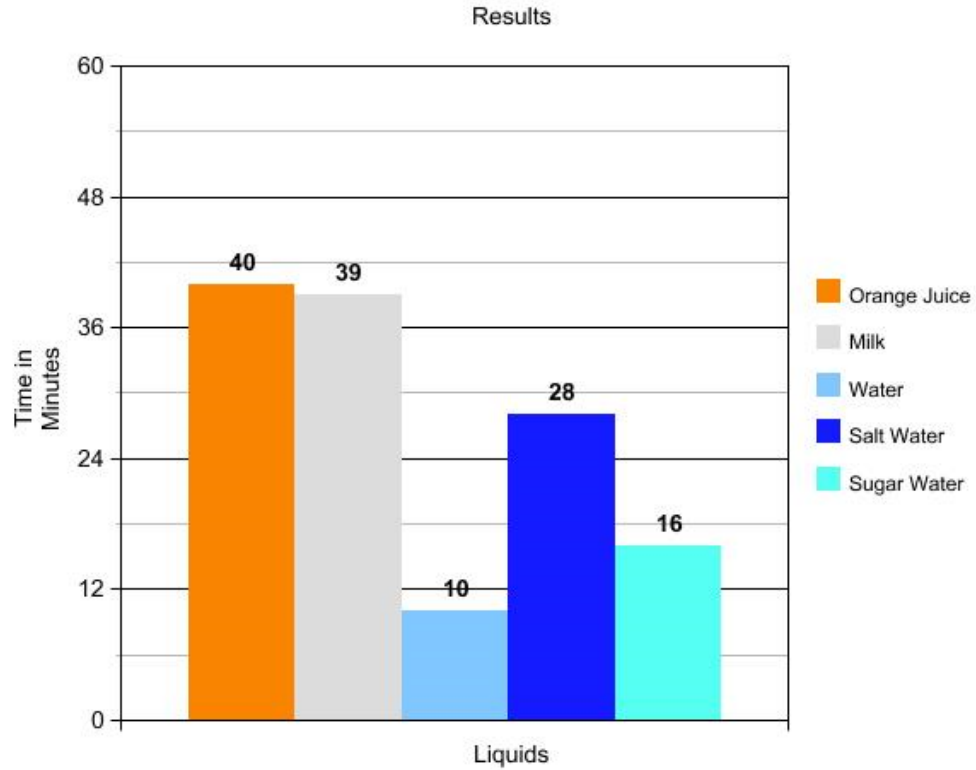
Experiment



Results and Data

	Orange Juice	Milk	Water	Salt Water	Sugar Water
1	32	22	6	14.25	10.5
2	32	36	7	24	14
3	29.5	34	8.75	32	16
4	38	34	6.5	12	12
5	35	31.5	5.5	14	12
6	35	28	8.5	23	18.5
7	35	30	8	27	17
8	35	32	9	29	28
9	35	32	8.5	30	19.5
10	26	34	8	17	14
11	33	35	7.5	22	14
12	31	30	6.5	27	10
13	54	54	14	37	21
14	47	47	14	29	18
15	44	44	16	35	18
16	56	56	14	35	14
17	52	52	11	39	23
18	52	52	12	27	21
19	52	52	13	41	14
20	53	53	13.5	43	11.5

Graph



Conclusion

My conclusion is that water causes ice to melt the fastest. This is because it was the least dense of the five liquids used.

Works Cited

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