

The Cold Water - Hot Water Experiment

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Can this statement be true? “A bucket of water is heavier than a bucket of rocks.” Think about it a bit and go on to the rest of this assignment.

One day in science class, Lisa asked her science teacher if it was really true that hot water freezes faster than cold water. She had heard her father say that their hot water pipes always freeze up faster than the cold water pipes. Instead of just answering her question, her science teacher asked what she thought. Lisa replied that she didn't think her dad could be wrong, so the hot water probably freezes faster. Her science teacher then suggested that she design and conduct an experiment to test her hypothesis. It was obvious that her science teacher was not going to tell her the answer, so she decided to find out for herself. Here is the report that Lisa handed in a few days later.

Directions: Read the following description of an experiment conducted by an 8th grade science student then answer the questions to the best of your ability.

Freezing Cold Water and Hot Water

by Lisa R.

For this experiment, my question was, "Does hot water freeze faster than cold water?"

My hypothesis was, "Yes. I think hot water freezes faster than cold water because my father told me that our hot water pipes have frozen when the cold water pipes didn't."

My procedure was as follows:

I filled a plastic cup about half full with hot water from our kitchen faucet. I then filled another cup about half full with cold water from our kitchen faucet. I then set both cups in the freezer. I looked in both cups every ten minutes to see what the water looked like. I also took the temperature of both cups of water every ten minutes and recorded the temperatures. Here are my temperatures and observations:

Minutes	Hot Water	Cold Water	Observations
10	85 °F	48 °F	Neither one frozen.
20	49 °F	38 °F	Neither one frozen.
30	42 °F	34 °F	Neither one frozen.
40	36 °F	32 °F	Cold water has thin ice on top.
50	33 °F	32 °F	Cold water ice is thicker.
60	32 °F	32 °F	Both have ice on top. Cold has thicker ice.

From the results of my experiment I conclude that cold water freezes faster than hot water, but I still don't understand why our hot water pipe froze and the cold water pipe didn't. My Dad is sure that I'm wrong because he had to replace the hot water pipe and the cold water pipe was right beside it.

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Discussion Questions

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Name _____ Date _____ Class Period _____ Table No. _____

1. List some pieces of information that were missing in Lisa's report.

2. Pick a couple of the things you wrote for the previous question and explain why they are important.

3. Is it possible that both Lisa and her father are right? Explain your answer.
