

The multi liquid tornado experiment



Problem / Testable Question

What liquid makes the longer lasting tornado?

Background Information

I searched a lot of websites for information, but the websites are only saying how to make a tornado, or how to make a better tornado. However I still know that different types of liquids don't affect on how the tornado is made, but it affects how long it lasts. If it was thicker, like tomato juice, it would be harder for the liquid to move around. With water, it was easier since it was not so thick. I also know how the tornadoes are formed. The tornadoes are formed by centripetal force, it pulls an object or liquid toward the center and makes the tornado.

Hypothesis

My hypothesis is that the hot water will make the longer lasting tornado because heat can make things move, so I think that the heat will make the water move more and faster than the other ones.

Variables

What variable was changed in your experiment?
(Independent Variable)

A variable that I changed in the experiment was, what liquid I was using every time.

What variable was measured in your experiment?
(Dependent Variable)

A variable that I measured was the duration of how long each tornado lasted.

Materials

Quantity (detailed list)	Materials (be specific)
1	Jar
1	Marble
¾ of the jar	Water
¾ of the jar	Salt water
¾ of the jar	Hot water
¾ of the jar	OJ(Orange Juice)
¾ of the jar	Sparkling water
¾ of the jar	Soap Water
¾ of the jar	Tomato juice

Procedure

1. Get a jar and fill it with water.
2. Put a marble inside the jar, and put a mark where when the marble touches it will count as a full rotation.
3. Spin the jar in a small circle 40 times and stop
4. Count how many times the marble touches the mark, and put the number on a paper.
5. Repeat 1,3,and 4 with as many liquids as you would like.
6. When you are done, see which one touched the mark the most, and then you are done.

Results

The liquid that made the best tornado, was hot water. The second best tornado was salt water, which makes sense because most hurricanes are from the ocean, and a hurricane is just a water tornado. The third best tornado was with regular water, the fourth best was with sparkling water, then soap, orange juice, and then the worst, tomato juice.

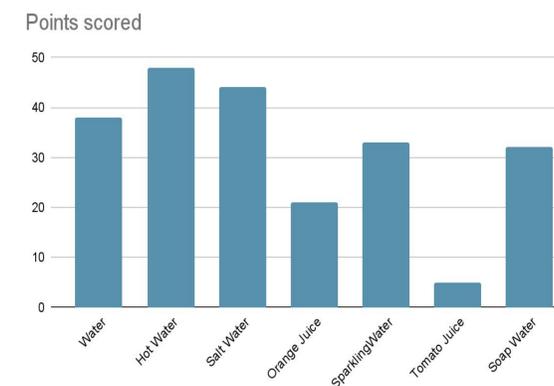
Photos



Chart

Type of liquid	Times spun	How many times it circled around
Water	40	38
Hot Water	40	48
Salt Water	40	44
OJ	40	21
Sparkling	40	33
Tomato Juice	40	5
Soap Water	40	32

Graph



Conclusion

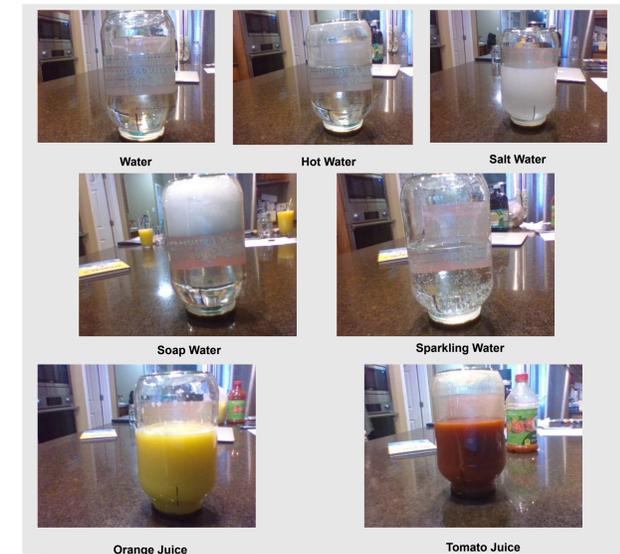
My results show that my hypothesis was correct, because hot water moved the marble around the jar the most. I was also very surprised when the salt water almost had the same number of spins as hot water. I was also surprised when the soap water didn't make a long lasting tornado, because I thought the soap would help the tornado spin more.

References

Tornado in a bottle

1. <https://www.stevespanglerscience.com/lab/experiments/so-da-bottle-tornado/>
2. <https://www.youtube.com/watch?v=IF2ZByWaUMI>
3. <https://sciencing.com/make-tornado-bottle-using-dishwashing-liquid-7965.html>

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Reflections on Learning



Please answer the following questions about your project.

1. Where did you do your project and who supervised you?

ANSWER: I did my project in my house, and my mom supervised me.

2. Please fill out the chart with the safety risks for your project and the safety measures you used.

Possible Safety Risk	Safety Measures Used
Example: Use Power Drill	Parent Supervised
Example: Handled Liquid Chemicals	Wore gloves and washed hands after use
Example: Plants Grew Mold	Threw plants away as soon as they molded

ANSWER:

Possible Safety Risk	Safety Measures Used
Water leak	Cap on really tightly
Jar could fall off table	Parent supervised
Sparkling water could explode	Slowly open jar
Hot water might break jar	Mixed with a little cold water.

Did you follow all of the Austin Energy Regional Science Fest's Elementary Rules and Guidelines?

ANSWER:

3. What gave you the idea for this project?

ANSWER: I got the idea of when I saw a video of how to make a tornado in a bottle, and when I made one out of water. I thought, I wonder what would happen if I used a different liquid? That is how I thought of which liquid makes a better tornado in a bottle?

4. What did you learn from doing your project?

ANSWER: I learned that I did not need to shake the jar 40 times, I just needed to give it a good shake, but then the tornado wouldn't have lasted that long.

5. What would you change about the project and why?

ANSWER: What I would change about this project is I would track how many seconds the marble rolled before it stopped. The reason why I would change it is because it might be a little more accurate.

6. What new questions do you have?

ANSWER: I wonder what would have happened if I had a more narrow bottle/jar. I also wonder what would have happened if I used a different shaped jar.

7. Is there anything else you want to tell your judge?

ANSWER: I really enjoyed this experiment, because the tornados were really cool and fun. It was very addicting to watch them.