

# Disney A WRINKLE IN TIME



Disney's A Wrinkle In Time + Fatherly present

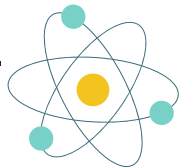
## The Dancing Oobleck

Our Universe is built of frequencies, forces, and energy that is all invisible to us — until we learn how to look. This is the beauty of physics and the idea that drives Disney's A Wrinkle in Time, the film that follows a fiercely curious girl as she seeks out her missing father, revealing the secrets of the Universe in the process. Inspired by the film, Fatherly + A Wrinkle in Time offer up a wild experiment you can do at home — to learn about frequency, non-Newtonian liquids, and how much fun physics can be.

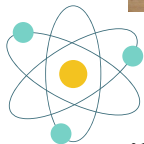
### What You Need

- Corn starch
- Water
- A mixing bowl
- Food dye
- A cookie sheet or plastic wrap
- A connected subwoofer

### Steps



1. Lay your subwoofer flat on the ground.
2. Place a cookie sheet or plastic wrap over it.
3. In a mixing bowl, mix one part water to ~2 parts corn starch (until it both jiggles and runs).
4. Pour enough to fill the cookie sheet or plastic wrap-protected speaker.
5. Search YouTube for "40 Hz Frequency bass test", play the sound, and watch the puddle dance. Now try another frequency (we have found 40- to 60-Hz works best).
6. Add drops of food dye to create swirling patterns.
7. Experiment with more water or more corn starch to change the viscosity of the liquid; play with the frequency; or add different dyes to make swirls and patterns.



### Science Lessons

#### Vibrations and Sound

The patterns in this experiment come from the waves. All sounds contain invisible shapes, or wavelengths, and when these bump into each other, wild patterns emerge.

*Mind-Blowing Challenge: What else in our world is invisible that we use something else to make visible?*

#### Non-Newtonian Liquids

When you add corn starch to water, it creates a substance that is not quite a solid and not quite a liquid. Scientists call this in between state "non-Newtonian."

*Mind-Blowing Challenge: Name three other objects that aren't only liquid, only solid, or only gas.*



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