

A STEM in the Park

Take Home Activity

STEM

in the **PARK**™

Science, Technology, Engineering, and Mathematics

Bath Fizzies



What You Need

DRY INGREDIENTS

- Baking Soda – 1 cup
- Citric Acid – 1/2 cup
- Corn Starch – 1/2 cup
- Salts – 1/2 cup (we used honey & milk epsom salts)

WET INGREDIENTS

- Water or Witch Hazel in a spray bottle: just a spritz (enough to just dampen the dough)
- Essential Oils (we used a citrus oil)
- Oil – 1 to 2 tablespoons (we used Baby Oil)
- Food Coloring

What To Do

1. Start by mixing together all of your dry ingredients into one bowl. It's a good idea to get everything mixed as evenly as you can, so take your time here!
2. Add in a small amount (dropper full) of the wet ingredients at a time and stir **QUICKLY** and vigorously. You will see a slight reaction, but the stirring will help stop it. **ONLY** use as much of the liquid as needed to create a moldable dough (error on the side of more dry than wet).
3. Using your spray bottle, spritz your dough with just a little bit of water or witch hazel. You don't want too much or your mixture will start to react. Stir. You want the dough to be moldable, but not mushy. Error on the side of more dry than wet.

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What To Do cont.

4. Find large molds for your Bath Fizzies (you can purchase these or be creative and find something that will work like muffin tins, but don't use anything too small or thin, as the Fizzies will break apart). You can also "hide" small plastic toys in the dough mixture for extra fun! Be sure to use a lot of pressure to make sure the dough is firmly pressed. If there is a lot of humidity in the air, be prepared for growing Bath Fizzies.
5. Let the Bath Fizzies dry at least overnight (if you are using a metal mold, you can BAKE in an oven set on the lowest temperature - 200 degrees F - for 45 minutes). Prepare for big fun at the next bath time!

CAUTION: *Be sure the bath is not too hot to enter safely. Do not eat/taste the Bath Fizzies.*

The Science

Key concepts: Mixtures, Solutions, Chemistry, Chemical reaction, Acids, & Bases.

When a Bath Fizzie comes in contact with water, the baking soda and citric acid react to make carbon dioxide bubbles. This is an acid–base reaction, where baking soda (also called sodium bicarbonate) is a weak base and citric acid is a weak acid. The dry ingredients together make a mixture, whereas the wet ingredients together represent a solution.

Digging Deeper into the Science of Bath Fizzies: Fill a tub with hot (but not scalding) bathwater. Toss a few Bath Fizzies in the tub. What happens? Do the Fizzies dissolve at the same rate? Is a Fizzy made from one recipe fizzier than a one made from another recipe? What happens if you change the amount of cornstarch (or other ingredients)? How do Bath Fizzies placed in hot vs. cold water compare? Could another acid such as lemon juice work like the citric acid? EXPLORE and find out!

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