



**Activity: Mad Science and DIY Volcanoes! (Acids & Bases)**

**Site(s):**  DAB  GAR  GLF  FOA

**Program level(s):**  Daisy  Brownie  Junior  Cadette  Senior  Ambassador

**Topics:**  STEM  Outdoors  Life Skills  Entrepreneurship  Art  
 Citizenship  Financial Literacy  Health  Relationships  Holiday

**Year:** 2020

**Girl Scout Leadership Experience (GSLE) Five Outcomes**  
*(choose and check at least one)*

<input type="checkbox"/> <b>Sense of Self:</b>	<i>Girls have confidence in themselves and their abilities and form positive identities.</i>
<input type="checkbox"/> <b>Positive Values:</b>	<i>Girls act ethically, honestly, and responsibly, and show concern for others.</i>
<input checked="" type="checkbox"/> <b>Challenge Seeking:</b>	<i>Girls learn to take appropriate risks, try things even if they might fail, and learn from mistakes.</i>
<input type="checkbox"/> <b>Healthy Relationships</b>	<i>Girls develop and maintain healthy relationships by communicating their feelings directly and resolving conflicts constructively.</i>
<input type="checkbox"/> <b>Community Problem Solving:</b>	<i>Girls desire to contribute to the world in purposeful and meaningful ways, learn how to identify problems in the community, and create "action plans" to solve them.</i>

**Leadership Keys and Girl Scout Processes (check all that apply)**

**Leadership Keys (what girls do):** Discover  Connect  Take Action

**Girl Scout Processes (how they do it):** Girl Led  Learn by Doing  Cooperative Learning

**Objective: GSCO Recruitment will host this lesson plan and project for their event on October 10, 2020 (Presenter: Nikki Adams, Pikes Peak Outreach)**

**With what Journey or badge work does this activity correlate?**

Think like a citizen scientist, P4 of Home Scientist Badge,

**Materials needed for viewers:**

- 2 plastic cups
- 1 large paper plate with a lip OR 1 baking sheet
- 1 TBSP baking soda

- 1 TBSP vinegar
- Scissors
- 1 piece of white, brown, orange, or yellow paper (a paper grocery/lunch bag is perfect for this)
- Tape

**Prep Time: 30 minutes**

**Delivery Time: 30 minutes**

**Activity:**

Nikki will give a presentation on acids and bases, portraying a mad scientist for a Halloween-like STEM theme. She will present different acids and bases in varying glass cups and show how they react to a red cabbage water “indicator” liquid. We will use the scientific method to predict each reaction and also decide which is an acid and which is a base before mixing.

**These acids and bases will include:**

ACIDS: Lemon juice, vinegar, milk

BASES: Baking Soda, Sugar, Laundry Detergent

Indicator: Boiled Red Cabbage Water

She will then take the kiddos through creating their own reactive volcano using one acid and one base. (The steps for this are direct from the Outreach LP, pictures taken by staff):

**Making a volcano to test mixing an acid with a base**

First, we will create our volcano body. You can use any type of cups for this.

**Step 1:** Have an adult help you cut a medium size hole in the top of one of your cups.



**Step 2:** You will also need to ask for help to cut the other cup in half.



Let's begin:



### Creating the outside of the volcano

If you would like to decorate the outside of your volcano you can do it several ways:

- If your cup is paper or Styrofoam, you can use sharpies and color right on the cup.
- If your cup is plastic, you can decorate a piece of plain paper the same height as your cup. When you are done wrap around cup and tape to fit.



## Creating the Acid Base Reaction

- **Step 1:** Take the small cup and put about one Tablespoon of baking soda into it
- **Step 2:** Set that cup on a cookie sheet or tray of some kind.
- **Step 3:** Place the “volcano” you made on top of the small container making sure not to spill the baking soda.
- **Step 4:** Measure 1/4 cup of vinegar into a measuring cup or glass
- **Step 5: Ready for magic!!** Slowly pour the vinegar into the mouth of the volcano and watch the fight!! You may not need all of the vinegar.

### Comments:

*There will be no PowerPoint for this lesson plan as Nikki will be presenting the actual science experiment and craft via ZOOM*