Introduction:

In this experiment, we’ll learn about some of the chemistry behind **acids**, **bases** and **butterfly pea flower tea.**

Materials:

* butterfly pea flower tea
* water and a hot water heater
* 3 small mason jars
* lemonade
* straw or stirrers
* pH testing strips
* baking soda
* funnel
* tall narrow beaker

Procedure (all actions/verbs to be completed by a student, except maybe the freezer and hot water part…)

1. Heat water. Fill a mason jar with 100 mL of hot water and 100 mL of water at room temperature. Place the butterfly pea tea package into the hot water. Avoiding the hot glass, put the butterfly pea tea mason jar into the freezer.
2. (While tea brews). Give students the info sheet. Either read the intro paragraph or ask each student in the group to read a sentence. Then ask the students to answer the following questions (without looking at the info sheet!).

[take your time here, this part should take 5 minutes to allow the tea to brew/cool, feel free to add additional discussion questions if needed]

Discussion questions:

* 1. Where is butterfly pea flower tea a common drink?
  2. What has butterfly pea flower tea been used for other than just a drink?
  3. What is **anthocyanin**? What’s special about anthocyanin?
  4. [make sure students understand what pH is and how it relates to [acids and bases](https://docs.google.com/document/d/1m0n_dxw1F4hGMiPfz9yCVFLVxcaXeyl7CD-o4gHMz4M/edit)]
  5. What happens to anthocyanin in the presence of acids and bases?
  6. Guess what colors the tea might change to when exposed to an acid or a base?
     1. Ask the students to record their guesses

1. Pour the lemonade powder into a second mason jar. Fill the mason jar up to the 200 mL mark with warm water. Use the stirrer to stir the lemonade.
   1. Ask students to look at/read the lemonade packet.
   2. Ask them: do they think lemonade is an acid or a base? Ask them to record their guess.
2. Pour a teaspoon of baking soda into the third mason jar. Fill the mason jar up to the 200 mL mark with warm water. Use the stirrer to stir the baking soda mixture.
3. Avoiding the glass (which may still be warm/hot), take the butterfly pea flower tea out of the freezer.
4. Using the funnel, pour 10 mL of tea into the beaker. Now, while watching closely, pour a small amount of lemonade into the beaker and observe the color change. Pour baking soda into the mixture and observe the color change. Were the students correct in their first guess as to how the color of the tea will change?
5. Ask the students what they think will happen if we change the order (tea, then baking soda, then lemonade). Test this order.
6. Ask students whether they think baking soda is an acid or a base. Ask them to record their guess.
7. Ask the students what other mixtures and orders they’d like to try. Get creative!
8. Use pH strips to measure acidity of lemonade and baking soda mixture. Ask them to record the pH values. Were the students correct?
9. Final discussion question: this tea (I believe) is 49% butterfly pea flower leaves (check package to be sure). Would the results of this experiment change at all if we used tea that was 100% butterfly pea flower leaves? If so, how?

To do:

-LAUREL: bring home brewed tea and bring kettle

~~-ALAINA: funnels, cups and additional straws from storage closet~~

-TRENT: fix write up into two different documents email them out

-TRENT: make sure we’ll have freezer