Materials:

- Red Cabbage
- Blender
- Distilled Water
- Lemon Juice
- Baking Soda
- Vinegar
- Soap
- Clear Cups
- Container for Red Cabbage juice (with lid preferably, this stuff smells nasty)
- Air freshener (for after)
- Lil plates

Lesson Outline:

- Explain Acidity/bases
- Conduct Experiment
- PH scale explanation
- Recap/Conclusion

Before kids come in:

- Have two plastic plates on each table, one with soap, and one with lemon juice
- Have cups filled with lemon juice, distilled water, vinegar, and baking soda
    - Label these cups with the liquid in the them

Acidity/Bases:

- What are some of your guys's favorite sour foods?
    - Lemons, sour patch kids, oranges, etc
    - **Ask** if they know why these foods taste sour
    - These foods taste sour because they're **acidic**
        - Acidity is a way to describe certain liquids or chemicals
        - Acids are **corrosive**, which means they slowly destroy and break down whatever they're in contact with.
    - The opposite of acids are things called bases
    - Bases are really bitter, or slippery when you touch them
        - Slippery soap and bitter vegetables examples of bases
        - **Ask:** what does corrosive mean? The word we just learned?
            - For bases, we use the word **caustic,** which is the same thing as corrosive
                - it'll eat away at a material if the base is strong enough
    - On tables is one plate with an acid, one with a base

        - Try and see if you can feel the difference between the two
            - **Ask:** what are the characteristics we talked about of acids? What about bases?
            - **Stress this point**: these materials are completely safe to touch, but only touch. Don't do anything with these materials that we didn't tell you to do b
        - **Ask** which one they think is the acid, which one they think is the base
            - tell them which is which

Experiment:

- pass out four clear, plastic cups to every student
- Fill cups quarter of the way up (roughly) with cabbage juice :(
- Pass out four pre-filled LABELED clear cups to each student (lemon juice, baking soda, vinegar, distilled water)
- Tell kids to pour the cup of lemon juice into one of the cups of purple liquid
- Continue until all the cups have been poured into the purple liquid

Experiment Explanation:

- **Ask** the kids what happened when the poured the different liquids into the purple liquid
- **Ask** if they know why this happened
- **Ask** if they have any guesses as to what the purple liquid is
    - This liquid is red cabbage juice! Which is why it doesn't smell so great!
    - This cabbage has a really special chemical, that allows it to change colors when it comes in contact with an acid or a base!
        - **Ask** if the kids know which of the liquids were acids, which were bases
            - Kind of a trick question! The lemon juice and vinegar were acids, the the baking soda was a base, but the water was neutral!
            - **Ask** what color the bases turned, what color the acids turned
                - In the world of chemistry and science, reds mean acids, and blues indicate bases!

PH Scale Explanation:

- At the beginning of the lesson, we gave examples of things that are acidic.
    - Who remembers what those examples were?
        - But what about acids that villians use in movies? They're probably not talking about lemon juice right?
    - Acids and Bases exist on something called he PH scale
        - Some acids are stronger than others, and the same goes for bases!
        - When we poured our liquids into the cabbage juice, they all turned different colors.

        - The lemon juice is a strong acid, so the color turned bright red
        - The vinegar is a less strong acid, so it turned a darker shade of red
        - The baking soda is a base, so it turned blue
        - The water is neutral, so it turned purple, somewhere in between the blue and red!
    - Scientists in the real world use a special kind of paper that changes colors, just like the cabbage did, to tell where a chemical falls on the PH scale

Review Questions:

- What does corrosive mean?
- What's the difference between caustic and corrosive?
- What are some examples of bases?
- What are some examples of acids?
- What scale do we use to measure how strong acids and bases are?