**Activity 14: Indicator Blues**

# How are acids and bases different? Hypothesis

Indicate whether you think the following substances will be acids or bases. There are two blank spaces for you to choose two substances of your own to test. Suggestions: soda pop, orange juice, rain water, milk, etc.

|  |  |
| --- | --- |
| **Substance** | **Acid, Base, or Neutral** |
| **vinegar** |  |
| **detergent** |  |
| **lemon juice** |  |
| **baking soda** |  |
| **ammonia** |  |
| **tap water** |  |
|  |  |
|  |  |

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# Materials

* red cabbage leaf (torn into pieces)
* water
* measuring spoons
* plastic ZiplocTM bag
* five small cups (paper or plastic)
* vinegar
* laundry detergent powder
* lemon juice
* baking soda
* ammonia
* masking tape
* ball point pen

# ADLC Digital Lesson: Physical and Chemical Changes

[https://www.](http://www/) youtube.com/watch?v=-CBEWlyup08

# Procedure

1. Place the red cabbage leaf pieces into the ZiplocTM bag. Add¾ cup warm water and close the bag tightly. Squeeze the bag of cabbage and water until the water turns dark blue (about three minutes). This dark purple liquid is your indicator solution.
2. Use your masking tape and pen to label the eight cups:
3. Cup 1: vinegar
4. Cup 2: detergent
5. Cup 3: lemon juice
6. Cup 4: baking soda
7. Cup 5: ammonia
8. Cup 6: tap water
9. Cup 7: a substance you choose
10. Cup 8: a second substance you choose
11. You will be placing two tablespoons of each substance that you are testing into its own cup. Be sure to WASH your measuring spoon thoroughly after each substance.
12. Cup 1: add two tablespoons of vinegar
13. Cup 2: mix two tablespoons of water and one teaspoon of detergent
14. Cup 3: add two tablespoons of lemon juice
15. Cup 4: mix two tablespoons of water and one teaspoon of baking soda
16. Cup 5: add two tablespoons of ammonia
17. Cup 6: add two tablespoons of tap water
18. Cup 7: add two tablespoons of a substance you choose
19. Cup 8: add two tablespoons of a second substance you choose4 Add two tablespoons of indicator solution into each sample cup you have prepared. Swirl to mix the cabbage juice and the substance in each cup.

5. Acids will turn cabbage juice pink; bases will turn cabbage juice green. Cabbage juice is purple in a neutral substance.

# Observations

Complete the following *Observations Chart:*

|  |  |  |
| --- | --- | --- |
| **Substance** | **Colour of Cabbage Juice** | **Acid, Base, or Neutral** |
| **vinegar** |  |  |
| **detergent** |  |  |
| **lemon juice** |  |  |
| **baking soda** |  |  |
| **ammonia** |  |  |
| **tap water** |  |  |
|  |  |  |
|  |  |  |

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# Conclusion

Based on your observations, complete the table below to answer your Explore Question: How are acids and bases different?

|  |  |  |
| --- | --- | --- |
| **Substance** | **Acids** | **Bases** |
| **What are the properties?** |  |  |
| **To what colour does cabbage juice change?** |  |  |
| **What samples did you test?** |  |  |