



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	

Materials

- red cabbage leaf (torn into pieces)
- water
- measuring spoons
- plastic Ziploc™ 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.youtube.com/watch?v=-CBEWlyup08>

Procedure

1. Place the red cabbage leaf pieces into the Ziploc™ bag. Add $\frac{3}{4}$ 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:
 - a) Cup 1: vinegar
 - b) Cup 2: detergent
 - c) Cup 3: lemon juice
 - d) Cup 4: baking soda
 - e) Cup 5: ammonia
 - f) Cup 6: tap water
 - g) Cup 7: a substance you choose
 - h) Cup 8: a second substance you choose
3. 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.
 - a) Cup 1: add two tablespoons of vinegar
 - b) Cup 2: mix two tablespoons of water and one teaspoon of detergent
 - c) Cup 3: add two tablespoons of lemon juice
 - d) Cup 4: mix two tablespoons of water and one teaspoon of baking soda
 - e) Cup 5: add two tablespoons of ammonia
 - f) Cup 6: add two tablespoons of tap water
 - g) Cup 7: add two tablespoons of a substance you choose

h) 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		

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?		