

Red Cabbage as a pH Indicator

Making the pH Indicator

What You Need:

- A red cabbage
- A pot of water

Procedure:

1. Break apart the cabbage into small pieces and place into a pot
2. Cover the cabbage in water and boil for 20 minutes, allowing the color to leach out of the cabbage (see picture on right).
3. The water should be purple and the cabbage can be removed.



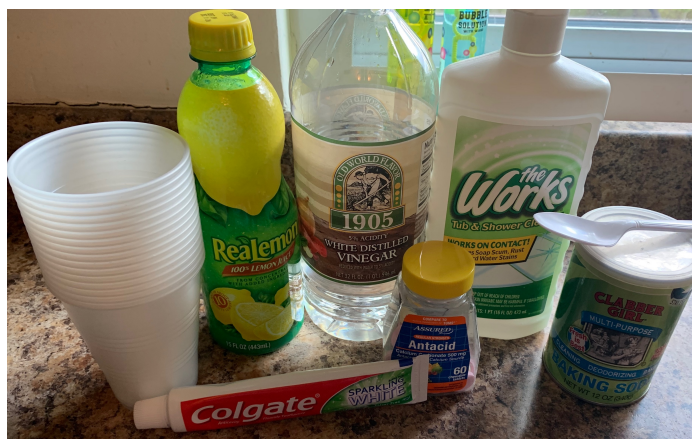
Testing the pH of Household Items

What You Need:

- Cabbage pH indicator
- Cups
- Household items
 - You can select any item you would like, but see table for some suggestions

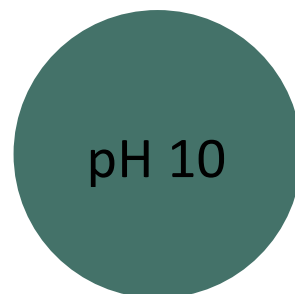
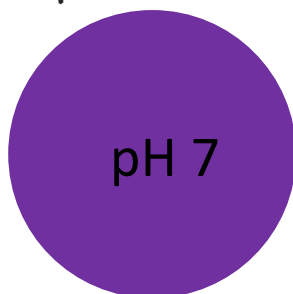
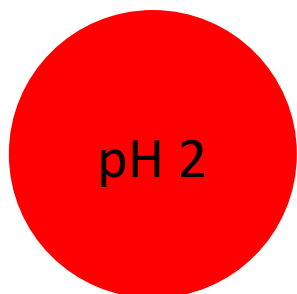
Procedure:

1. Pour cabbage water into cups (about half full)
2. Add different household items to cups until color change is observed. **Use a different cup for each household item, do not mix different items in the same cup!**
3. See pH indicator color table to identify the pH of your item ☺



Possible Household Items	pH
Lemon Juice	2
Vinegar	3
Baking Soda	9
Tums	10
Toothpaste	varies
Cleaning Solution	varies

Red Cabbage pH Indicator Colors

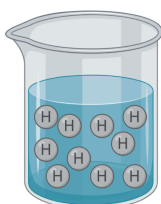


How Does It Work?

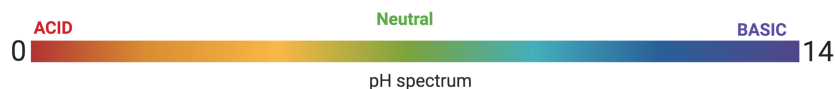
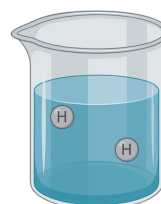
The purple color of red cabbage serves as a natural pH indicator because it contains a pigment called flavin. Flavin changes color depending on the pH of the solution. Remember that pH is a measurement of hydrogen ions, where a lot of hydrogen ions results in a low pH (acidic) and a low number of hydrogen ions results in a high pH (basic). Water is neutral meaning that it has a pH of 7 which is why the water turns a violet color when the cabbage is boiled. When different household items are added to the purple water (pH indicator) it changes the pH of the water resulting in a color change. In acidic solutions (pH 2) flavin turns a reddish-pink and in basic solutions (pH 10) flavin turns a teal. The household items suggested in this activity only goes as high as a pH of 10, but note that the pH scale goes up to 14 and that very basic solutions turn a greenish-yellow. For more information visit:

https://www.teachengineering.org/activities/view/wst_environmental_lesson02_activity3

Low pH = A lot of
Hydrogen Ions



High pH = Few
Hydrogen Ions



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Other household items that can be used as a pH Indicator

- | | |
|--------------------------------|----------------------------|
| 1. Beets | 6. Grapes (red and purple) |
| 2. Blackberries or Blueberries | 7. Horse Chestnut Leaves |
| 3. Cherries | 8. Morning Glories |
| 4. Curry Powder | 9. Onion |
| 5. Geranium Petals | 10. Petunia Petals |

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pH Scale

