

# Red cabbage juice indicator



# Make an indicator yourself

## Test for acids with red cabbage juice



### Research question

In the laboratory, chemists use ready-made test sticks (pH indicators) that can change color to examine whether a liquid is acidic. Unfortunately, we don't have anything like that at home. But we can make our own test tool with red cabbage juice.

**How does red cabbage juice change its color when it comes into contact with liquids of different acidity?**

### You will need:

- Approx. 200 g fresh red cabbage
- Cooking pot
- Sieve
- Balance
- Measuring cup
- Cutting board and knife
- Empty jars
- Tap water
- Empty, dark glass bottle
- "Test liquids": detergent, citric acid solution\*, aqueous solution of baking soda\*, distilled water\*)



# How to do it – part 1: Making indicator juice

Step by step



## Prepare the red cabbage

Weigh 160 g red cabbage and carefully cut it into small pieces.



## Infuse in water

Heat (moderately) 250 ml water in a saucepan. Now put the red cabbage into the water and let everything steep for at least 15 minutes.



## Filter red cabbage juice

Separate the leaves from the juice using a sieve. Leave the red cabbage juice to cool to room temperature – if possible don't expose it to light. Pour the juice into a bottle (e.g., brown olive oil glass bottle). Now you can use the red cabbage indicator.

**Important: Ask your parents to help you with this!**

# How to do it – part 2: Testing liquids

## Step by step



### Preparation

Place a piece of paper in front of each glass and number the pieces of paper with the numbers 1-5. Put together liquids that you can examine:

1. 50 mL tap water + 50 mL citric acid
2. 90 mL tap water + 10 mL washing-up liquid
3. 100 mL distilled water
4. 100 mL tap water
5. 100 mL tap water + 1 teaspoon baking soda

**Pour the liquids** into the five glasses one after the other. Remember the order exactly. Then add a tablespoon of your red cabbage indicator to each glass.

**Assign the colors** to the liquids. Note the order: the most acidic liquid is citric acid (red). Then the acidity decreases from left to right. The solution with baking soda is not an acid, but a so-called base - it is colored green/blue.

**Examine any other fluids** you have at home. For example, you can examine your favorite drinks. What color does the red cabbage indicator get with it?

# More information

For parents and teachers



## Context

Chemists often use pH indicator paper in the laboratory as an aid to determine the pH value of liquids. This paper is impregnated with chemicals that change color depending on the pH value. This aid is not available at home. However, natural pH-indicators can be used, which also change their color depending on the pH-value. One such indicator is red cabbage juice.

## Red cabbage juice indicator

Red cabbage contains the dye cyanidine. It is a particular type of anthocyanidin. It is a pigment found in many red berries. It can also be found in other fruits such as apples and plums, and in red cabbage and red onion. This chemical compound reacts to changes in pH value and changes its color in the process. In an acidic environment it is red in color, in neutral liquids violet and in alkaline blue. These gradations can be shown with the test liquids mentioned in the experiment.

