

Suzy's World

What makes purple cabbage juice turn red?

Fact

- Purple cabbage juice always reacts with acids and bases to change colour in a chemical reaction. The cabbage produces a particular colour for each reaction so it is called an indicator.
- Acids such as lemon juice or vinegar make the cabbage indicator juice turn red and alkaline substances such as baking soda turns the juice blue.
- Add the red indicator mixture to the basic blue indicator mixture and the acid is neutralised by the alkali and the liquid turns purple again.



Do you know

- The word acid means sour. Lemons are sour because of the acids in them. Vinegar contains acetic acid so it's sour too.
- An alkali is a soluble base. Many alkalis are made by scientists, such as baking powder and washing soda. They have hydroxide, oxide or carbonate in their names. Carbonates are found in marble, seashells and eggshells in the crevices in the Moeraki boulders.
- A base neutralises an acid – it cancels the acid so it's not as acidic any more.
- The poison in a bee sting is an acid and the poison in a wasp sting is an alkali.

Experiments you can do

What you need:

An adult to help you

A clear work space like a kitchen bench – or put down plastic and newspaper because this can be messy. An apron might be a good idea too.

Half a purple cabbage, cut into very small pieces

1 medium sized bowl

Boiling water

1 jug

A sieve

4 small, clear numbered containers (drinking glasses would do)

3 teaspoons

Lemon juice

Vinegar

Baking Soda



Suzy's World

Continued... What makes purple cabbage juice turn red?

What you do:

Put the tiny pieces of cabbage into the bowl and get an adult to pour in enough boiling water to cover it (Use at least one cup).

Leave it to sit for at least 15 minutes so the water is really purple. Then strain the purple water into a jug using the sieve to collect all the cabbage.

Now carefully pour about $\frac{1}{4}$ cup of purple juice from the jug into the 4 clear containers.

Do not add anything to container 1. Add one teaspoon of lemon juice to container 2, one teaspoon of vinegar to container 3 and one teaspoon of baking soda to container 4. What happens?

Try out some other substances from your kitchen. How about sugar, or salt or washing powder or shampoo? Are they acid or alkalis then? What does the liquid from a tea bag do? Repeat all your trials with cabbage juice indicator.

Other Investigations

Try making indicators from other things. What other vegetables will give you a good strong colour? How about beetroot or silverbeet leaves or marigolds or camellias?

Do they react with acids and alkalis in the same way?

Let me know how you get on.