

Red cabbage rainbows

In this activity, learners create rainbows using drops of red cabbage indicator homemade indicator paper using items you can find in the kitchen cupboard.

Watch the video here: <https://bit.ly/3iavujW>

In this video, education coordinator (<https://rsc.li/2EVZq4m>) Rosie demonstrates how you can make red cabbage indicator, a dark purple liquid which changes colour when it comes into contact with an acid or an alkali, and use it to create rainbows. This simple activity can be set for learners to try at home with a responsible adult or used as a classroom experiment.

Equipment list

- Red cabbage
- Paper and plastic wallet
- Kitchen roll
- Lemon juice (acid)
- Soda bicarbonate (alkali)
- Washing powder (alkali)
- Sieve
- Pots and pans
- Paint brush

Health and safety

- If this activity is set for the students to try at home it is important that a responsible adult is present at all times.
- Take care when using knives and boiling water.
- Do not drink the red cabbage indicator.
- Remember that some household substances can be harmful – make sure you read any warnings on the bottle or packet before you decide whether or not to use it.

Activity instructions

Preparing the red cabbage indicator and the homemade indicator paper

1. Take three leaves of the red cabbage and chop them into small pieces.
2. Put the chopped up red cabbage into a pan, add enough water so the cabbage is just covered. Boil the cabbage for about ten minutes. Another way to make the indicator is by blending the leaves or leaving them to soak overnight. But if you boil the cabbage, then you can make indicator and have cabbage for your tea!
3. Once the red cabbage and the water is cool, put a couple of pieces of kitchen roll in a sieve and drain the red cabbage through it, collecting the water in a bowl underneath. The red cabbage will have dyed the water purple creating indicator, and will also stain the kitchen roll to make the indicator paper.
4. Leave the dyed kitchen roll to dry.

Preparing the acids and alkalis you find in the kitchen

- When using liquids, such as lemon juice, pour a small amount into a container.
- When using powders such as washing powder or bicarbonate of soda, mix a small amount with some water in a container.

Creating rainbows using drops

1. Draw a rainbow onto a piece of paper and put it inside a poly pocket.
2. Use a paintbrush to drop the red cabbage indicator onto the rainbow.
3. Use a separate paintbrush to add some acids and alkalis that you can find in your kitchen to the drops of red cabbage indicator. Watch as some of the colours of the rainbow appear.

Creating rainbows using homemade indicator paper

1. Once your homemade indicator paper is dry you can paint a rainbow onto the paper using the acids and alkalis that I've found in the kitchen.
2. Add an acid or an alkaline onto your paintbrush and then paint it directly on the indicator paper. You should see that the paper instantly changes from purple to a colour – the colour will depend on which acid or alkali is used.

Explanation

Red cabbages contain anthocyanins, these change colour when they come into contact with an acid or an alkali. For example, acidic lemon juice turn the red cabbage indicator line, alkaline washing powder turns it green and alkaline bicarbonate of soda turns it blue. Have a go with your learners and discover what other acids and alkalis you can find in the kitchen cupboard.

Also check out

- Red cabbage pH indicator (<https://rsc.li/3jUcqiW>) – more information on how to use the red cabbage indicator in the primary classroom as well as a further activity: Making a pH rainbow wand. A colour chart is included in the download on this page.
- More simple experiments using everyday equipment which your learners can try at home or you can bring to the classroom on our YouTube playlist (<https://bit.ly/2YZ7kRN>).
- Read the CLEAPSS guidance on practical activities for pupils at home during extended periods of school closure, GL339 (<https://bit.ly/32Q8wli>).
- Read the SSERC guidance for primary home learning (<https://bit.ly/3bhG0Dn>).

■ This resource was downloaded from here: <https://rsc.li/32OwFzS>