



# national science week

9-17 August 2025



## Dish Soap as a pH Indicator

What household chemicals make your dish soap change colour?

### Safety

Safety glasses/goggles and rubber/vinyl gloves are recommended with all chemical experiments and demonstrations.

### What you need

- 3 small-ish clear containers or PET bottles (300ml – 600ml)
- 300ml-500ml of water
- Green coloured liquid dish soap
- Vinegar
- Bicarbonate of soda (bicarb)

### What to do

- 1) Add a tablespoon of bicarb into one container. Add water to dissolve the bicarb and set aside.
- 2) Pour around 100ml (or one-third of a cup) of water into another container.
- 3) Slowly add liquid dish soap to the water and carefully swirl to mix to avoid generating too many bubbles. Continue adding dish soap and swirling until you see a colour change.
- 4) Add small amounts of vinegar to the dish soap mixture until you see a colour change. Observe the new colour.
- 5) Add small amounts of the bicarb solution until you see a colour change. Observe the new colour.
- 6) Try the experiment again with other brands of dish soap and see what colours change.

### What's happening?

pH is a measure of how acidic or basic a chemical is. A pH number between 1 and 7 indicates a substance is acidic while a pH number between 7 and 14 indicates a substance is basic. A pH number of 7 means a chemical is neutral.

This colour change occurs because the pigment in the pH indicator alters its chemical structure when exposed to an acid or base. The change in structure affects how light is absorbed and reflected, resulting in a visible colour shift.

**Results**

Colour before adding vinegar	Colour after adding vinegar	Colour after adding bicarb solution

**Did you know?**

There are other natural pH indicators you can use. A common experiment involves boiling red cabbage or butterfly pea flowers and using the liquid left behind as an indicator. Did you know the tannins in black tea act as an indicator as well? Take note of the colour of iced lemon tea compared to black tea.

**Find out more**

- Red cabbage indicator from Sydney Water <https://www.youtube.com/watch?v=rgJgZ1Z-0xg>
- pH indicator from blueberries <https://melscience.com/AU-en/articles/blueberries-indicator-experiment/?srsId=AfmBOopGhLGTYSur1sF2QPiM8IW3ALodavMjDBBiW4fobUavRQOugSuk>
- Other plants as pH indicators <https://www.thoughtco.com/home-and-garden-ph-indicators-601971>