

# LEARN AT CHESTER ZOO

## CABBAGE PH SCIENCE

(Teacher's Guide)

**AIM:** Create your own pH indicator and look at the pH of different substances. This activity can be used to discuss water science and adaptations of fish to their environments.

### Before you start:

Cut up the red cabbage into small pieces and put into washing-up bowl. Pour in a kettle full of boiling water and leave to soak until water has returned to room temperature. Divide students into smaller groups and give each group some of the cabbage solution in a medium bowl.

### Step 1 – Sieve and divide

The water will change to a dark purple colour because a substance called **flavin** leaches out of the cabbage. Flavin is the pigment used in blue, red and purple paints!

Students must sieve their cabbage to remove the chunks and leave behind the purple water. Divide this water into smaller containers. **Be careful because cabbage-water will stain things – you may wish to do this before handing it out, or just wear aprons!**

### Step 2 – Make a rainbow

Use a tablespoon to add a small amount of a household substance to each beaker/shot glass. Watch! Acidic substances will turn the water pink/red and alkaline substances will go blue/green. Experiment with other substances - can you make the whole range of colours??

### Things to think about afterwards...

Why do our aquarium team need to monitor pH in our fish tanks? Some fish are specially adapted to live in very acidic or alkaline conditions. We have some incredible species which can live in peat swamps and acidic lakes. Look up the **Pearl Gourami** and **Pheonix rasbora** as examples! Also discuss the effect of **ocean acidification** (which is a climate change impact) and the wider impact on food chains and ecosystems.

### What you'll need:

- 1 red cabbage
- Knife and chopping board
- Kettle and washing-up bowl
- Medium containers (2 per group)
- Small containers
- Sieves (1 per group)
- Teaspoons to sample substances
- Selection of **ACIDIC** and **ALKALINE** substances such as: lemon juice, vinegar, cola, ketchup, washing liquid, baking powder, toothpaste, shampoo, chalk...anything really!



Remember to share your class' work on our Twitter page.

We'd love to see it!

@LearnatCZ