

Science Live Event

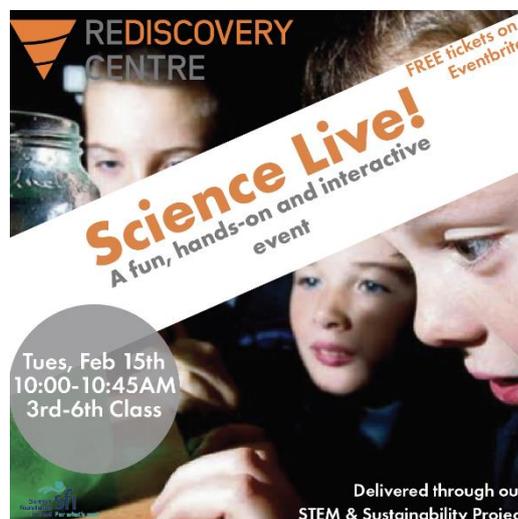
Join the Rediscovery Centre online on February 15th for a fun, exciting Science Live event!

Your primary class can conduct science experiments along with our Education team as we take you through fun and hands-on science experiments. Learn about the amazing acids and bases, looking at their colour changing ability, messy reactions and investigate how climate change is affecting our oceans.

Suitable for 3rd-6th Class.

Date and time: Tue, 15 February 2022 10:00 to 10:45am

Eventbrite www.eventbrite.ie/e/science-live-tickets-245854737137



Investigation 1: Acids and Bases

Investigate what happens when you add acids and bases into the juice from a red cabbage. Red Cabbage is a natural pH indicator, which means that it changes colour when you add a substance, depending on whether it is an acid or a base.

Materials and Equipment – per group:

- Red cabbage water – made in advance and divided into jugs (one jug per group)
- One tray/basin (makes clean up easier!)
- 8 small containers, spoons/lollipop sticks
- 1 print out of red cabbage pH scale and 1 worksheet
- Variety of common household substances to test: washing up liquid, bicarbonate of soda, baking powder, lemon juice, vinegar, sugar water, citric acid, etc.

Method:

Making Red Cabbage water:

1. Tear the red cabbage into large pieces and place in a bowl with hot water.
2. Microwave for 3 to 4 mins and leave to cool.
3. Drain the water into jugs or bottles, ready to be used. It should be dark purple in colour.

During the Science Live event:

1. Ensure all of the groups have the materials needed
2. During the live event, the Rediscovery Centre Presenter will explain acids, bases and indicators to the students.
3. The Presenter will demonstrate how red cabbage juice works as an indicator by putting some lemon juice into one of the glasses with the red cabbage juice. Watch the colour change. Lead a discussion on whether the lemon juice is an acid or a base.

4. The students in their classrooms should predict whether the substances are acids or bases on the worksheet.
5. The students in their classrooms can then test the different substances (e.g. vinegar, washing up liquid) by adding to the glasses using spoons, observing the colour change with reference to the pH scale and write the results on their worksheet.

Investigation 2: Acid-Base Reaction

Investigate Acids and Bases: what happens when you combine a base (bicarbonate of sodium) and an acid (vinegar).

Materials and Equipment – per group:

- Approx. 10ml of vinegar in one container and 10g of bicarbonate of soda in another.
- Container to mix the acid and base

During the Science Live event:

1. Ensure all of the groups have the materials needed
2. During the live event, the Rediscovery Centre Presenter will introduce the investigation.
3. The students in their classrooms should predict what will happen when an acid and a base are mixed together.
4. The students in their classrooms can then test the reaction, and then test the pH of the resulting mixture using some red cabbage water.

The Science

Acids and Bases: Scientists often classify materials in order to understand more about them. One way of classifying liquids is whether the substance is an acid or a base. Substances act differently depending on whether they are an acid or a base (or neutral).

What is an acid? An acid is a substance that has a low pH (between 0 and 6). Examples of acids are lemon juice and vinegar, and they tend to have a sour taste.

What is a base? A base is a substance that has a high pH (between 8 and 14). Examples of bases are bleach, bicarbonate of sodium, and have a bitter taste.

What is the pH scale? Used by scientists to measure how acidic or basic a liquid is. Acids have low pH of 0 to 6. Bases have high pH of 8 to 14. If a liquid has a pH of 7 it is neutral, such as water.

pH indicators (or acid-base indicator): a compound liquid that changes colour over a range of pH values. The colour change indicates whether the added substance is an acid or a base. Litmus paper and red cabbage are examples of indicators.

When an acid and a base are placed together, they react to neutralise the acid and base properties, producing a salt, water and carbon dioxide. The chemical reaction between baking soda (sodium bicarbonate) and vinegar (acetic acid) produces carbon dioxide gas, which forms bubbles.

Acids & Bases Worksheet

Record the results of your investigation on whether the substances are acids or bases in the table below, as shown in the example.

TEST SUBSTANCE	PREDICTION	RESULTS		
		ACID	BASE	NEUTRAL
E.g. Lemon juice	Acid	x		

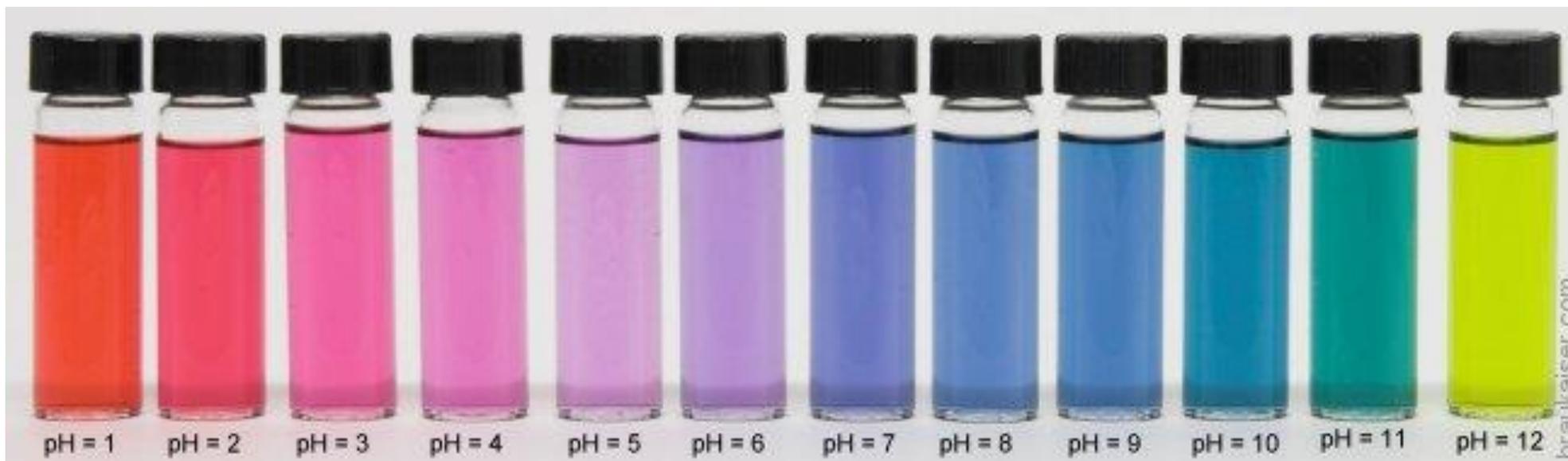
Acid-Base Reactions

What is your prediction for what will happen when you add an acid to a base?

What happened when you did the investigation?

Red Cabbage pH Scale

To be printed for the
Science Live event
(one per group in
each class)



ACID

NEUTRAL

BASE