

WINTER STEM *A Licence to chill*



Waterworld

Water is perhaps our most common chemical, but it is also a remarkable substance with some strange properties. This show emphasises the importance of water and shows some of its unusual behaviour.

The Chemical Challenge (8+) This task requires students to identify mysterious white powders by making observations, recording what they see and drawing conclusions. The chemical challenge provides an opportunity to carry out an experiment in the systematic way a scientist tests material; using a 'well tray' - an ice cube tray can be used. This activity will help to develop an understanding of chemical reactions. You will need to pause, the video to watch the reactions and record the changes observed. There are two sections in the chemical challenge, students will use observations and learning from Section 1 to make deductions and draw conclusions in Section 2.



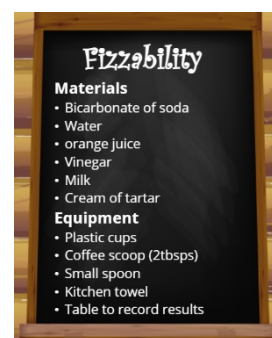
Power of Magnets: 10+ In this activity students will learn about the power of magnets and how magnets are affected by heat. This session is led by a charismatic presenter who enables the difficult science of magnets to be understood. The presenter also provides information on life and work skills and the session ends with a prompt for students to keep finding out things for themselves.



Resources: Different types of magnets and magnetic materials if you wish to recreate some of these activities.

Fizzability: Test the 'fizzability' of things found in your kitchen, while having fun and learning about measuring acidity. Emilia is a chemist, and she does some tests on 'Fizzability' – testing the acidity of common products found in most kitchens, using things you have in your home. Try and find out the answer to the question...how acidic are the things you drink?

Resources: Bicarbonate of soda, milk, orange, cream of tartare, water, plastic, cup, coffee scoup, teaspoon, kitchen towel, table to record results.



Red Cabbage Challenge. Robin, a STEM Ambassador, created this activity with his grandchildren, now it's time to give it a try! This activity develops an understanding of acids and alkaline substances in everyday life.

Resources: Clear Glasses, Red cabbage, teaspoons, small saucepan (can use a microwave) Vinegar, bicarbonate of soda, water, lemon juice, white sugar.



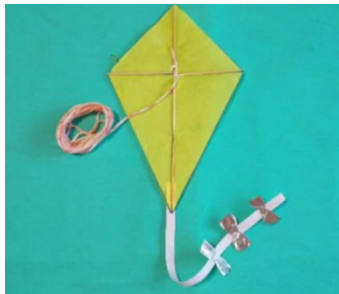
'Seek by iNaturalist'. Use an app on a phone or iPad to identify animal and plant species. Joe and Rodrigo show you how to use the app *'Seek by iNaturalist'*. Follow along as they identify some ways this can be used and the problems that sometimes exist.

Resources: phone or tablet with camera.

Magical Möbius loops & other shapes: Prepare to be surprised by the strange properties of a Möbius loop and other shapes. Explore the weird and wonderful world of mathematical topology, a branch of mathematics that you may not have heard of before!



Resources: strips of paper, some glue and a pair of scissors.



Kite Calamity: In this challenge the residents of Star Town need your students' help! Their kite festival has failed to get off the ground, and the organisers have said that even though the festival was for beginners, and everyone brought amazing kites, none of them managed to get off the ground. What a calamity! The video outlines how to make a kite that will lift off the ground, and then improve the design to make it even better.

Resources: Plastic bags and paper for the body, String or wool, Foil (optional for tail bows), Ruler, Pencil, Cocktail sticks, Sellotape and glue, Scissors (be careful when cutting and ask an adult to help you if needed)

Snow globe: In this activity you will learn about viscosity and how it influences the speed at which objects sink in liquids. In this activity you will test different liquids to find out the materials that make an effective snow globe.

Resources: Water, Glycerine, some objects to add to the liquid, such as glitter or cake decorations, clear containers to test the liquids, timer, glass jar with a lid, glue, small figure or toy



Boat Race: This activity demonstrates the science of water tension. Start by following the video to create a card/paper boat. Students then test the boat and then change the shape of the boat to try and improve it. There is an opportunity to decorate the boat or develop the activity and create new investigations.

The material the boat is made from is important, challenge the students to choose a material that would work well.

Resources: Paper/card etc., Scissors, Washing-up liquid or liquid soap, A toothpick or cotton bud, A shallow tray to hold water, such as a lunchbox lid, Water, A stopwatch (a phone)