ICE CREAM IN A BAG

You will need:
A large bag of ice
Salt
Milk - can be flavoured
1 small sealable plastic bag
1 large sealable plastic bag
Tea towel

Optional - vanilla essence, chocolate drops, sprinkles, a cone!

Instructions
Pour a cup of milk into the small sealable plastic bag. Check the bag is tightly sealed. You don't want the salty ice getting inside.

Half fill the bigger sealable bag with ice and add two tablespoons of salt.

Put the milk bag into the ice bag and give it a good shake. Carefully roll the ice over the milk keeping the milk in contact with the ice as much as possible.

Wrap the bag in a tea towel to protect your hands if it becomes too cold to touch.

Check the milk after 5 minutes, if it's not a similar consistency to ice cream keep going!

How does it work?
Adding salt to ice lowers the freezing point of salt by a few degrees (freezing point depression). When salt is added to the ice in the outer bag, the ice (which is at 0°C) is suddenly above its freezing point, and starts to melt. Melting requires energy which in this case is taken from milk mixture in the inner bag, causing the milk to freeze!!

Ice cream is made up of droplets of fat from milk jumbled up with millions of tiny crystals of ice and pockets of air.

Adult supervision required. You are responsible for your own safety. www.sciencesparks.com
Method

Test 1 - bicarbonate of soda and vinegar
Drop half a teaspoon of bicarbonate of soda into one small container. Add a teaspoon of vinegar and watch the mixture fizz!

Test 2 - bicarbonate of soda, vinegar and washing up liquid
Drop half a teaspoon of bicarbonate of soda and a small squirt of washing up liquid into a clean container and mix well with a small spoon.

Add a teaspoon of vinegar, this should give you a lovely thick foam!

Test 3 - bicarbonate of soda and lemon/lime
Carefully slice the top off a lemon or lime about one third of the way down. Use the spoon to squish the inside of the lemon/lime up a little.

Drop about half a teaspoon of bicarbonate of soda into the lemon/lime, it should start to fizz straight away.

Add a little washing up liquid for a thicker foam!

Add food colouring for a colourful eruption

Take care using acidic substances. They may sting skin.
Lemon or Lime Challenge

Sam wants to create a lemon or lime eruption for a school project and wants to choose the one that makes the most fizz. Can you help?

Remember to make it a fair test.

Things to keep the same
Amount of lemon/lime juice
Amount of bicarbonate of soda

Things to keep the change
Whether lemon or lime juice is used.

What to measure
How high the fizz reaches up the container.
How long the reaction takes before stopping completely.

Method
Squeeze the same amount of lemon and lime juice into two identical containers. About 20ml should be enough.

Add half a teaspoon of bicarbonate of soda into each container.

Time how long the reaction lasts and how high up the container the fizz reaches.

Whats happening?
Baking soda and vinegar (or another acid) react to neutralise each other (vinegar is an acid and baking soda an alkali) releasing carbon dioxide which is the bubbles of gas you see.