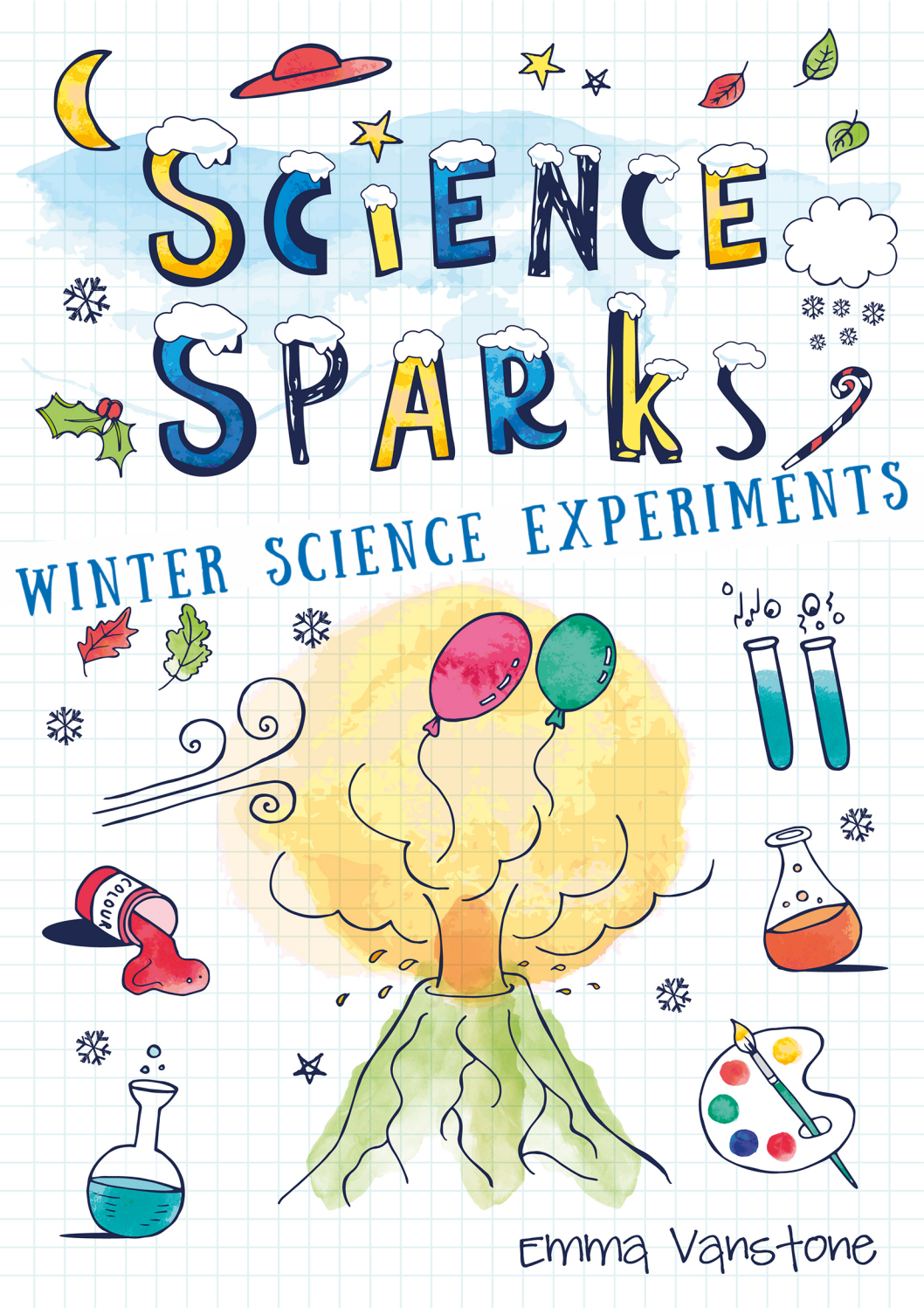
Science Sparks

Winter Science Experiments

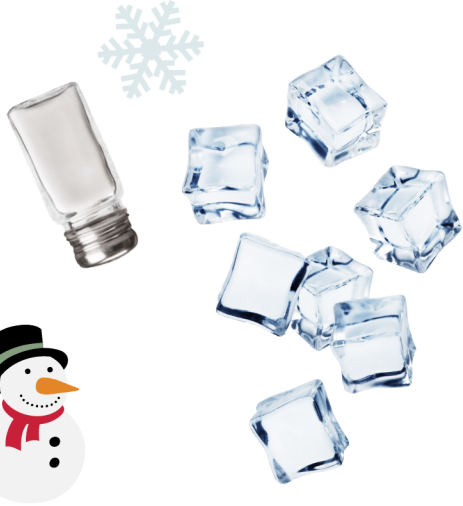


Emma Vanstone

Ice and Salt

You'll need

Ice
Salt
Tray
Warm water
Timer
Cold water
Pipette or spoon



Instructions

Place 4 ice cubes in the tray.

Ice cube 1 - control
Ice cube 2 - warm water - 1 tablespoon every 30 seconds
Ice cube 3 - cold water - 1 tablespoon every 30 seconds
Ice cube 4 - salt - half a teaspoon of salt every 30 seconds.

Start the timer. Every 30 seconds drip cold or warm water or salt onto an one of the ice cubes.

Watch what happens. Keep a record of how each ice cube changes over time. Which melts first?

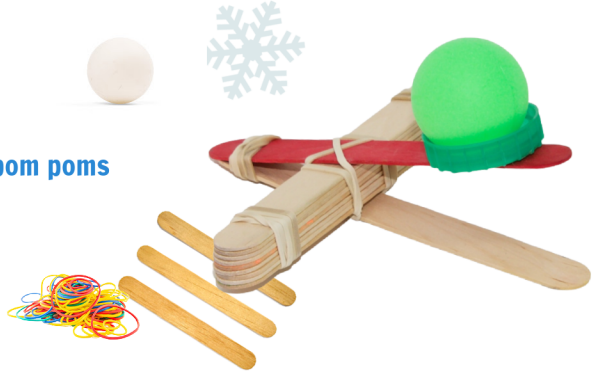
Challenge

Try again with bigger ice cubes or even a giant ice cube (cake moulds are good for making large ice scupltures).

Snowball Catapult

You'll need

Wide lolly sticks
Elastic bands
Table Tennis Ball or pom poms
Double sided tape
Milk bottle top
Tape measure



Instructions

Take 6 lolly sticks and place them on top of each other. Twist an elastic band around each end to hold them in place.

Place another stick above and one below the stack of 6 so they make a cross shape.

Tie an elastic band around the middle of the cross.

Twist another elastic band around the bottom of two sticks.

Attach a milk bottle top using double sided tape or strong glue.

Challenge

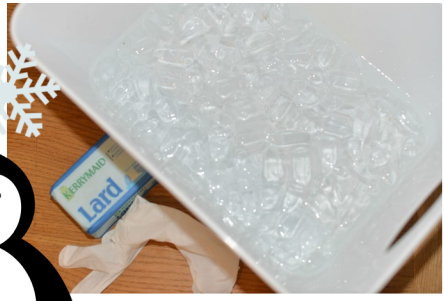
Experiment with pom poms and table tennis balls, which fly the furthest?

Can you knock down a stack of paper cups?

How do penguins stay warm?

You'll need

200g Lard
Latex gloves
Ice
Water
Medium sized container
Stop watch



Instructions

Half fill the container with water and ice.
Carefully place your hands in the water and time how long before it becomes uncomfortable.
Put a latex glove on one hands.
Cover the gloved hand with lard.
Place the gloved hand in the water and again time how long it takes to feel uncomfortable.
The lard acts as an insulator protecting your hands from the cold of the icy water.

Challenge

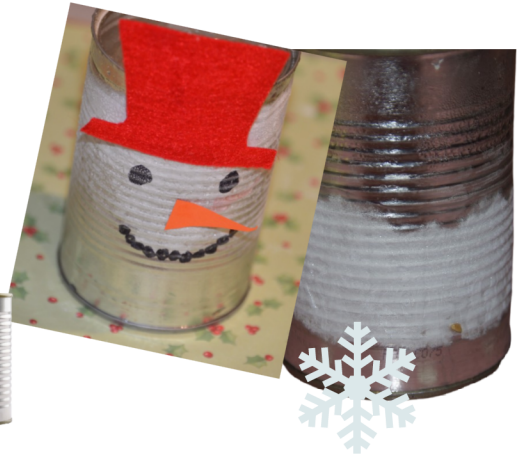
Find out why penguin's feet don't freeze.

Polar Bears also have a thick layer of blubber and hollow, colourless fur which traps heat from the sun helping to keep them warm in winter. How do you think Polar Bears cool down in summer?

FROST ON A CAN

You'll need

A clean empty can
Crushed ice
Water
Salt
Spoon



Instructions

Fill the tin can about half full with ice and add a little water and a couple of tablespoons of salt.

Wait and watch the frost form. If it doesn't work, try adding more salt.

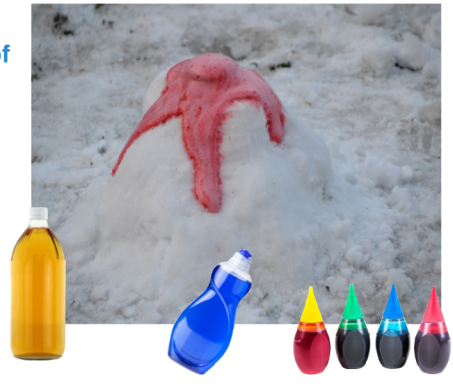
Why does it work?

Initially the temperature of the icy water will be around the freezing point of water (zero degrees Celsius). However, for frost to form it needs to be even colder, which is why salt is needed. Salt lowers the freezing point of ice, making the ice melt. To do this it draws heat from the surroundings (in this case the tin can) making them even colder. The salt reduces the temperature on the surface of the can to below freezing point which makes the water vapour in the air condense and freeze on the surface!!

SNOW VOLCANO

You'll need

2 spoonfuls of baking soda (bicarbonate of soda)
1 spoonful washing up liquid (dish soap)
A few drops of red food colouring
30 ml vinegar
Spoon
Snow
Small container



Instructions

Add everything except the vinegar to the container and stir well.

Carefully shape a volcano shape around the container using snow.

Add the vinegar and watch as the volcano erupts! If it doesn't work very well, add a bit more washing up liquid and vinegar and stir again.

Why does it work?

Vinegar (an acid) and bicarbonate of soda (an alkali) react together to neutralise each other. This reaction releases carbon dioxide, a gas which is the bubbles you see. The bubbles of gas make the washing up liquid bubble up to give a lovely thick lava!