SCIENCE
CHALLENGE

FROSTY CAN SNOWMAN

How to create frost using ice, water and salt

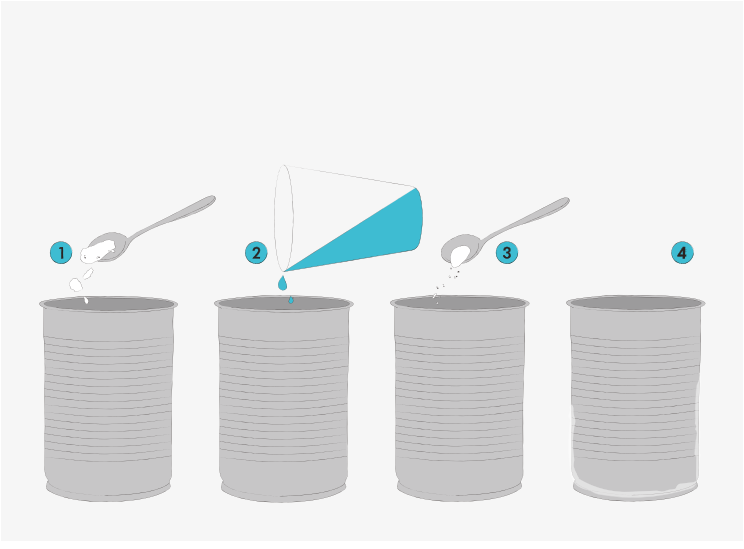
THE
JAMES
DYSON
FOUNDATION

Method

1. Fill the tin can about half full of ice.
2. Add water.
3. Add a couple of tablespoons of salt.
4. Wait and watch the frost form.

Materials

- A tin can
- Crushed ice
- Two tablespoons of water
- Salt



How does it work?

The air around us holds a lot of water which is called water vapour. Cold surfaces generally make the water vapour condense into liquid form because colder air can't hold as much water. If the surface is very cold (below the freezing point of water) the condensed water vapour freezes, this is frost!

Try comparing how fast the frost forms on two cans using ice cubes and crushed ice. Which would you expect to be faster, and why?

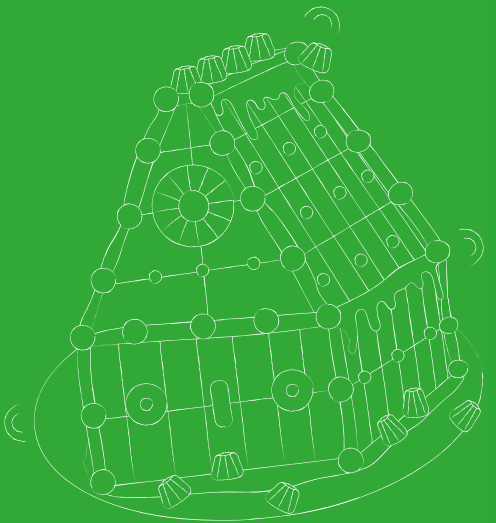
Did you know?

Salt lowers the freezing point of ice, making the ice melt. To do this it draws heat from the surroundings making them even colder. In this case 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 can.

ENGINEERING
CHALLENGE

CHRISTMAS BISCUIT HOUSE

How to construct a biscuit house
that can withstand an earthquake



THE
JAMES
DYSON
FOUNDATION

Method

1. Use a paper plate or piece of cardboard as the foundation of your biscuit house.
2. Plan how you are going to construct your house using bourbon biscuits or other similar biscuits.
3. Use the icing or melted marshmallows to stick the biscuits together. This method will secure the walls to your foundation and the roof to the walls.
4. Reinforce or decorate your biscuit house with other sweets, marshmallows and icing.
5. Set your biscuit house on a table*. Shake the table to test how strong your house is.

Materials

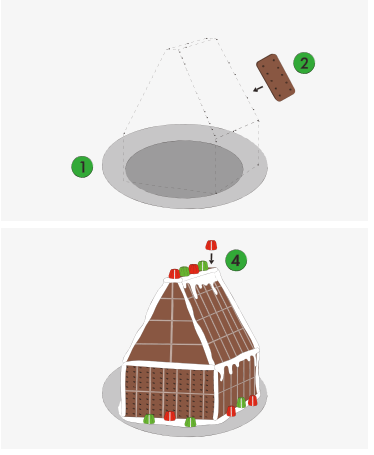
A paper plate or a piece of cardboard

Bourbon biscuits or a similar biscuit

Icing made with icing sugar and water

Jelly sweets, marshmallows and other sweets

* With adult supervision.



How does it work?

A home with a strong base is more likely to be resilient in an earthquake. Reinforcing lower levels by doubling up the biscuits will strengthen the base, helping it to withstand the load from the higher levels. Decorative, non-structural elements add to the weight your base must support.

Did you know?

Seismic engineers work within the field of structural engineering and are responsible for designing, constructing, and maintaining buildings that can withstand earthquakes.