OpenUp Science

CAMBRIDGE SCIENCE CENTRE

Issue 42
Sweet Treats

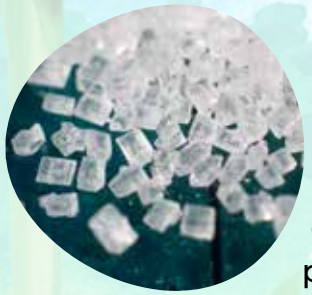
Welcome to OpenUpScience

from Cambridge Science Centre.

This issue is all about Sweet Treats.

Most people LOVE sugar - it's in all of our favourite food like sweets, chocolate, cake and dessert. But where does sugar come from? Well, sugar comes from plants!

Green plants take in energy from the sun and use it to make a sugar called glucose that they use as a kind of energy to help them grow. When we eat the glucose from these plants, it tastes yummy and sweet. Most of the sugar in the UK comes from sugar beet which is grown here in East Anglia! Sugar can also come from sugar canes which look kind of like grass.



Does this mean sugar is a vegetable? Well, not quite. In fact, sugar is a very good source of energy, but too much is bad for you. Sugar is a chemical made of carbon, oxygen and hydrogen. If you look closely at pure sugar, you will see it's made of crystals!

Discover a little more about sugar and find some experiements and activities that you can do with some sweet treats inside this issue!

Monster Marshmallows

Make a marshmallow into a massive monster!

What you'll need

- Microwave
- Food colouring and cocktail stick
- Marshmallows
- Paper plate
- **Adult supervision**

What to do

1. (Optional) Draw a monster face on a marshmallow in food colouring with the cocktail stick.
2. Put the marshmallow on the paper plate and, with adult supervision, put it in the microwave for 30 seconds.
3. Watch your marshmallows through the microwave window. What do you see happening? Your monster face should be growing!
4. When the time is up, get an adult to take the marshmallow out of the microwave. ***Warning: it will be hot!***
5. Wait for 30 seconds and then you can eat your marshmallow monster. What do you notice about it?

Experiment with putting the marshmallow in the microwave for different lengths of time. Does this change the size, taste or texture of your monster?

What is happening?!

Marshmallows are made of sugar, water and air bubbles. When we put something in the microwave, water in that thing heats up. The water in the marshmallows heats up the sugar and the air. When sugar heats up it gets softer, and when the air heats up, the air bubbles get bigger. The air bubbles push against the soft sugar, making the marshmallow monster grow!

Sweet Treat Sink Or Float

Which sweet treats sink and which float? Find out with this experiment.

What to do

1. Unwrap your collection of sweet treats.
2. Have a look at them and hold them in your hands. Which ones do you think will sink and which will float? Record your predictions in the results sheet.
3. Test each of your sweet treats by dropping them in the jug of water and record your results. Were your predictions correct?

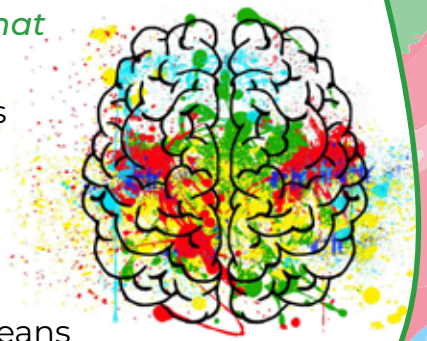
What you'll need

- A selection of sweets and chocolate
- A jug of water
- A pen
- A results sheet

Whether an object sinks or float depends on how dense it is. If the obejct is more dense than water, it will sink, and if it is less dense than water, it will float.

Why is sugar so tasty?

Biscuits, brownies, flapjacks, chocolate...you name it, most things with sugar in are delicious. But why? Some scientists say that everyones "natural sweet tooth" is *something that humans evolved* - many sweet-tasting foods such as ripe fruits are safe and nutritious, while bitter-tasting plants are often poisonous.



What's more, our brain needs 20% of the calories we eat and it needs most of this as sugar. This means *our brain rewards us when we eat sugar* - it's no wonder it tastes so good!

Sweet Treat Sink Or Float Results

Record your results here!

Type of Sweet Treat	Prediction	Sink or Float?

What, if anything, surprised you?

Growing Gummy Bears

Make a gummy bear grow while learning about osmosis.

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What you'll need

- Gummy Bears
- A glass of water
- A ruler
- A timer
- A spoon

Osmosis is when a material (like gummy bears) lets water pass into it. This will only work with certian materials and if the concentration of water outside the material is more than inside it!

What to do

1. Pick out a gummy bear and measure its length using the ruler. Record this length in the table below.
2. Place the gummy bear in the glass of water and start the timer.
3. After 5 mins, use the spoon to carefully take the gummy bear out of the water and measure its length again. Record it in the table and place the gummy bear back in the water.
4. Repeat this for the intervals in the table.

What is happening to the gummy bears texture? Would it work with other sweeties? What about other liquids?

RESULTS TABLE

Time passed	***At the start***	***5 minutes***	***10 minutes***	***30 minutes***	***1 hour***	***2 hours***
Length (cm)						

Sugar from an apple is better for you than sugar from sweeties *True* ☐ *False* ☐

How much sugar?!

Sugar isn't just found in sweeties. In fact, sugar can be found in almost every food! Can you match the food to the amount of sugar in it?

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44 teaspoons

8.75 teaspoons

5 teaspoons

4 teaspoons

2.5 teaspoons

Pot of yoghurt

Can of cola

Jar of pasta sauce

Apple

250g of raisins

Solutions at the back

Starburst Mind Games

Blow your mind with this trick of the tongue!

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What to do

1. Close your eyes.
2. Ask your friend to pick a flavour of Starburst out of the bag and unwrap it for you.
3. With your eyes still closed, hold you nose with one hand and get your friend to put the unwrapped Starburst in the other hand.
4. Put the Starburst in your mouth and chew on it for a few seconds. Can you guess the flavour? *How does it taste?*
5. Let go of your nose. Can you guess the flavour now? *How does it taste different?*

What you'll need

- Starbursts
- A friend

Your tongue can actually only sense 5 basic tastes; sour, bitter, salty, umami (savoury) and **sweet**. *The more complex flavours are detected by the olfactory receptors in your nose, which is why it's harder to identify the fruit flavours with your nose held.*

Sugar causes plaque to build up on your teeth which leads to tooth decay.

True ☐ *False* ☐

Chocolate Detectives

Can you identify the chocolate bar?

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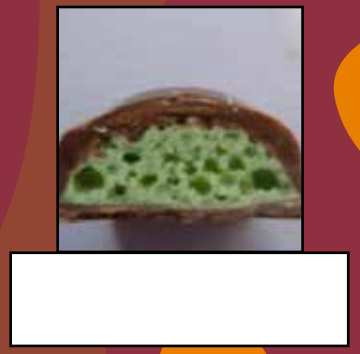

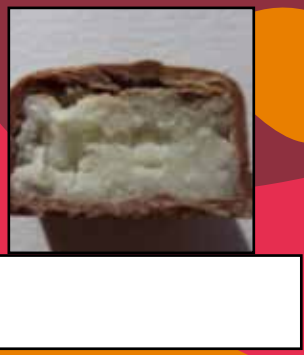

Images: kensquiz.co.uk

Grow A Rainbow!

Watch a rainbow grow from skittles!

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What to do

1. Organise the skittles in a circle around the small plate.
2. Gently pour the warm water into the centre of the plate. Make sure to pour enough so that the water goes past the skittles.
3. Sit back and watch the rainbow form!

What you'll need

- A small plate
- Skittles
- Warm water

What is happening?!

Skittles are covered in a coating made of sugar and edible ink. When you add warm water, the coating dissolves and starts to spread! The sugar moves to areas of water with a lower sugar concentration, which is the middle of plate. This means all the streaks of colour and sugar move towards the centre of the plate.

Did you know?

All sugar molecules are made of Oxygen, Carbon and Hydrogen. Sugar has a few different names; Sucrose, glucose, fructose... Look at the ingredients of your sweet treats. Anything ending in **OSE** is a type of sugar!

Puzzle solutions

If you have any questions or want to send us a photo of your experiments, drop us an email at *openupscience@cambridgesciencecentre.org*

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Sugar from an apple is better for you than sugar from sweeties

True ☐ *False* ☑

Your body can't tell the difference between sugars used in making sweets and those occuring naturally, as all sugar is broken down in exactly the same way. However, apples are better for you than sweets because they are a good source of vitamins and minerals - which sweeties are not!

Sugar causes plaque to build up on your teeth which leads to tooth decay.

True ☑ *False* ☐

Bacteria in plaque use sugar as energy and release acid as a waste product. This means when you eat sugar the plaque grows and the acid dissolves the tooth enamel!

This issue has been kindly supported by

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