CAMBRIDGE SCIENCE CENTRE

OpenUpScience

Issue 13

Welcome to OpenUpScience, the weekly magazine from Cambridge Science Centre. It's nearly the summer holidays so this week's issue is all about summer science fun. Get out into the sunshine, get messy with bubbles and fountains and then chill out with your homemade ice cream.

We look forward to long, sunny days in summer, but why is it usually warmer in summer? The Earth revolves around the Sun, and it is tilted slightly on its axis. The tilt of the Earth and its orbit around the Sun give us the seasons. During the summer months, the Northern hemisphere is tilted towards the Sun, this means that the Northern Hemisphere receives more direct sunlight. The warming effect of the Sun is more intense, so temperatures are warmer.

Spark, Ignite, Fuel, Illuminate

Big bubbles

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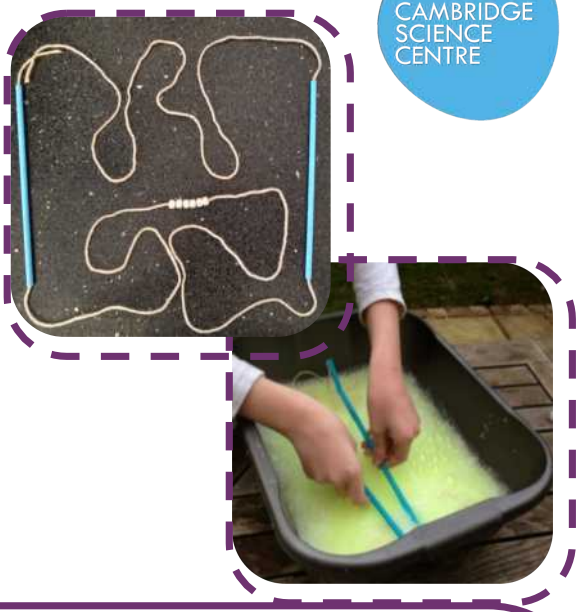
What you'll need

Bubble mix
- 500 ml warm water
- 125 ml washing up liquid (Fairy if possible)
- 2 tbsp glycerine
- Washing up bowl
- Spoon

Wands
- 2 drinking straws
- A length of wool or string (about 8 times longer than one straw)
- Metal washers or beads
- Wooden skewer (optional)
- Scissors



What to do

1. In the washing up bowl, add the washing up liquid, glycerine, and water.
2. Stir gently - you want to avoid making bubbles and froth.
3. Leave to sit while you make your wands.
4. Thread the wool/string through one straw. Use a wooden skewer to help push the string through.
5. Add a few metal washers or beads to the string for weight.
6. Then thread the string through the other straw.
7. Tie the ends of the string together.
   You should have a loop of string with two straw handles.
8. Dip the straw wand into the bubble mix, slowly raise your arms and walk backwards.
   Make sure your hands are wet with bubble mix too!
   Keep trying, it works once you get the hang of it!

Homemade ice cream

What you'll need
- 1 bottle of milkshake
- 2 ziplock bags
- Ice cubes
- Salt
- Towel

What to do

1. Pour the milkshake into one ziplock plastic bag. Make sure the bag is fully sealed.
2. Put some of the ice (about 10 cubes) and two tablespoons of salt into the second bag.
3. Put the sealed bag with the milkshake inside the ice bag.
4. Add more ice to cover the milkshake bag.
   The milkshake should be sealed in its bag and should not be in contact with the salt.
5. Wrap a towel around your double bag and shake the bag until the milkshake has frozen (5-10 mins).

Ice must absorb heat to melt and change from a solid to a liquid – this is called an endothermic process. If you hold ice in your hand, your hand gets cold as the ice absorbs heat from your hand.
In this experiment the heat from the milkshake is absorbed by the ice and so the milk cools. When you add salt to ice, it lowers the freezing point of the ice, so the ice must absorb even more heat from the environment to melt. This makes the ice colder than it was before, which is why your ice cream freezes.

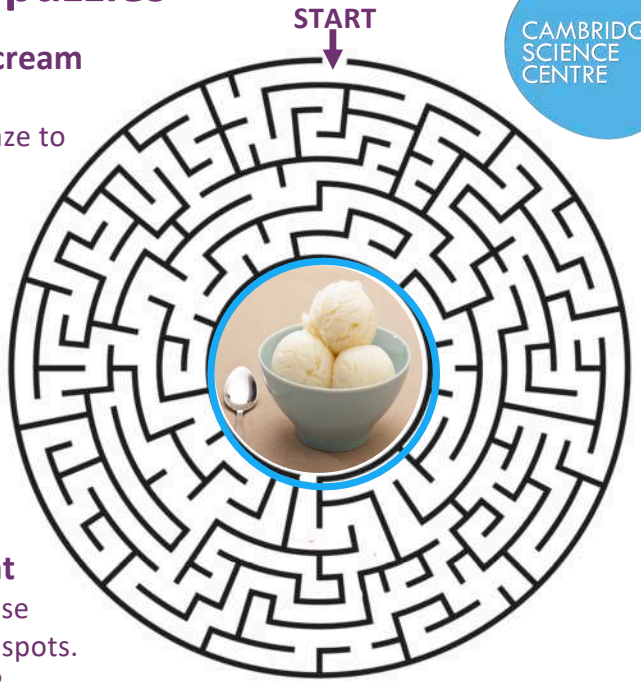
Did you know..?

Before freezers were invented, stone ice houses were used to store ice that had been cut from frozen lakes or rivers

Summer puzzles

Amazing ice cream

Find your way through the maze to your ice cream.



Ladybird Hunt

Only one of these ladybirds has 4 spots. Can you find it?

Juice carton boat

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What you'll need

- Empty juice carton
- Scissors
- 2 lolly sticks (or pencils)
- 2 rubber bands
- Glue
- Strong tape
- Bath, paddling pool or large tub of water

What to do

1. Cut out one side of the empty juice carton.
2. Use the side piece to make two squares and cut a slit into each square.
3. Fit these two pieces together as shown to make a paddle wheel (you can glue them in place).
4. Attach a lolly stick (or pencil) to either side of the juice carton using strong tape or a tight elastic band.
5. Wrap the other elastic band over the ends of the lolly sticks (or pencils).
6. Slide the paddle wheel through the elastic band.
7. Twist the elastic band a few times and then release your boat in a bath or paddling pool.

As you twist the elastic band you are changing movement energy (called kinetic energy) into stored up energy (potential energy). When you let go, the potential energy is changed back into kinetic energy as the band unwinds, making the paddle move.

Butterfly feeder

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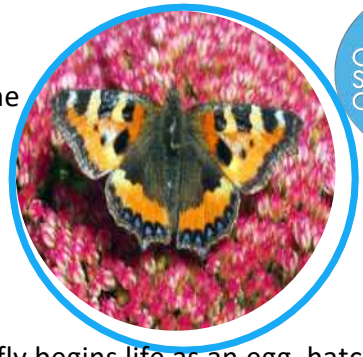


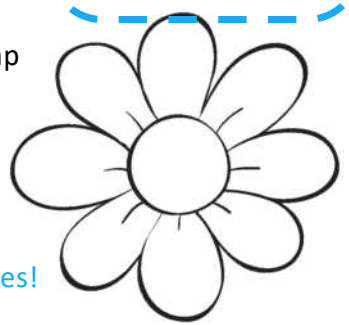
Summer is peak butterfly time with warm, sunny weather. Most adult butterflies only live for about two to three weeks. During their short lifetime, they undergo a complete change, or metamorphosis. Each butterfly begins life as an egg, hatches into a caterpillar, pupates into a chrysalis and then emerges as an adult. Butterflies need warmth to be active and fly, and they need to drink nectar for energy. We can attract butterflies to our gardens by planting plenty of flowering plants, or we can give them an extra sugar boost with a butterfly feeder.

What you'll need

- White card
- Pens
- Scissors
- Milk bottle cap
- Cotton wool ball
- Glue
- Tape
- A straw or wooden skewer
- Water
- Sugar

What to do

1. Make some sugar water
   - dissolve 1 tsp sugar in 9 tsp water
   - Keep in the fridge
2. On a piece of card draw a flower shape (like the one below)
3. Colour in your flower with bright colours
4. Cut out your flower
5. Glue a clean milk bottle cap to the centre of your flower shape
6. Glue a cotton wool ball into the bottle cap
7. Stick a skewer to the back of your flower (to stick your feeder into a flowerpot)
8. Soak the cotton wool ball in sugar water
9. Place your feeder outside



Look out for beautiful butterflies!

Lemonade fountain

What you'll need

- A bottle of diet lemonade
- Some Mentos mint sweets
- Paper
- An outside space
- Permission from a grown up!

What to do

1. Check with a grown up, and find an outdoor space.
2. Roll the paper into a tube and put 5-6 mints into the tube.
3. Put your finger over the bottom of the tube to hold the mints.
4. Unscrew the cap of the lemonade bottle.
5. Line up your mint tube with the top of the bottle.
6. As fast as you can, drop all the mints into the bottle.
7. Move out of the way!

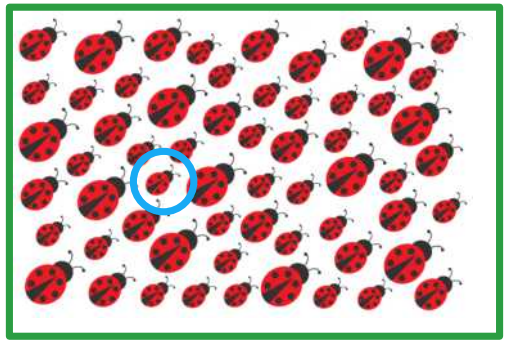
What's happening?

Lemonade is full of bubbles of carbon dioxide. These bubbles are just waiting to escape from the bottle. Dropping something into the lemonade speeds up the process by breaking the surface tension of the liquid and allowing bubbles to form on the surface of the mints. Mentos are covered in tiny dimples, which increase the surface area and allow lots of bubbles to form really quickly.

Puzzle Solutions

Amazing ice cream

Ladybird hunt



The next issue of OpenUpScience is out on:
Monday 3rd August

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