by Isabel Thomas | May 18, 2017

Science for fun – six super science activities to try at home

Hands-on activities are a great way to start talking about science at home, without the pressure to learn a particular set of facts or write up your work. Like science itself, it's playing with a purpose.

They harness children's natural creativity and curiosity and overlap with the arts in an approach known as 'STEAM' (science, technology, engineering, art and maths).

Think of these activities as 'science for pleasure' – the equivalent of having a kick about in the garden. You don't need to teach your children the rules and history of football to enjoy playing at home – it's the fun and togetherness that can inspire a lifelong passion for the game. Ditto for art, baking, reading or anything else you enjoy doing as a family. Fun science activities will get children interested and asking questions – which is much more important than having all the answers.

1. Bake the solar system

Research the solar system together, in a book or online. Talk about how you might decorate biscuits to look like the Sun and planets. To make simple biscuits, mix 200 g of butter and 100 g caster sugar together until pale and creamy, then mix in 300 g of plain flour. Ask your child to divide the dough into nine pieces – one for the Sun plus the eight planets of the solar system. They could try to represent their sizes, or even make them to scale! Roll out the balls into circles around 5 mm thick, and bake them on a lined baking tray at 160°C for 15-20 minutes.

When the biscuits have cooled, it's time to decorate them. Set out any decorations you have to hand: icing sugar for dusting, melted chocolate for painting, coloured icing, or chopped up fruit. This is your child's chance to be creative with the information they've learned. Will they add craters to Mercury, rings to Saturn or a great white sweetie spot to Jupiter? When the biscuits are ready, you could put them in order of distance from the Sun. This activity gives a hands-on

2. Make colour-changing art

My youngest son loves mixing ingredients together to see what happens. Mostly I leave him to it, but sometimes it's good to suggest ingredients that will have dramatic effects. You can make colour-changing paint by covering some chopped red cabbage with boiling water (make sure children do not go near boiling water). Leave the mixture to cool completely, then strain to get rid of the bits. When the purple liquid is completely cold, let your child paint a piece of paper (or dye an old white T-shirt) purple.

Now to make the potion change colour. Pour out small amounts of lemonade, lemon juice, vinegar, baking soda (dissolved in water), and soap or mild laundry detergent (dissolved in water), into a paint palette or egg cups. Encourage your child to dab, splat and flick the 'paints' on to their purple canvas to see what happens. They'll discover that the purple pigment changes colour, turning pink or blue-green depending on the 'paint' that they use.

Red cabbage contains anthocyanins, pigments that change colour as when they are mixed with more acidic or alkaline liquids. See if your child can spot any patterns, and talk about which 'paints' might be acidic and which might be alkaline. You can experiment with other foods and liquids, but read the labels first to make sure they are safe for children to handle. At the end, your child can display their colour-changing creation.

3. Go on a science scavenger hunt

A scavenger hunt adds a fun science focus to a walk in the woods or a trip to the park. You can write your own list of things to find (look at books about seasonal change for

double-sided tape to a piece of card, and peel them off when you get there. Then your child will be able to create their own natural art on the move.

Scavenger hunts encourage children to look closely at the world around them. Back at home, talk about the things they've collected. They could compare their collection with the results of a scavenger hunt from a different season, e.g. noticing that trees drop flowers in spring, and nuts in autumn. Children will be thinking like scientists as they make observations and notice patterns. Make sure they avoid picking wild flowers or berries.

4. Sculpt with sugar

Ask your child to create a mini sculpture using a pipe cleaner. They can dip it into cold water, then into a saucer of dry sugar until it's completely coated. Leave it to dry.

Meanwhile, heat 250g of sugar in a small pan with 750 ml of water. When the sugar has dissolved and it starts to boil, take the pan off the heat. Be very careful when heating sugar, and don't let your child near the mixture until it is completely cool. When the mixture is cool, pour it into a large jar or glass.

Bend both ends of second pipe cleaner to create a hook. Use this to dangle their sculpture into the jar of sugar syrup, hooking the other end over a pencil. Make sure the sculpture doesn't touch the side of the jar. Leave their creation on a sunny windowsill.

Over the next few days, your child will be able to see crystals grow. When they are happy with the size and shape, remove sculpture and let it dry. This activity lets your child see that solids that dissolve in water have not vanished. They are still there, but broken up into pieces too small to see. As the

glass. How do they compare to the original sugar?

5. Make a marble run

Raid the recycling box and challenge your child to build a marble run by taping cardboard ramps and tubes to the back of a door. Masking tape will allow them to reposition parts easily, and is kind to paint! How long can they keep a marble going from top to bottom?

This activity gets children talking about gravity, friction and simple machines – even if they don't know it! They'll probably use ramps, and could build in other simple machines too, like a pulley over the door handle, a lever as a see saw, or a wheel and axle to create a spinning effect as the marble zooms past. Children love inventing, and this activity is lots of fun for the whole family.

6. Cornflour goop

This is a very popular activity, which gets even better if you scale it up! Tip a tub of cornflour into a tray. Half fill the empty tub with water and mix it in gradually. Talk about how the mixture changes. While it is still thick and gloopy, it's time to play. Drop items in. Try pouring the mixture, banging the container, or scooping up a ball of goo and scrunching it tight. Relax your grip and watch what happens.

If you're outside, get barefoot and try standing or jumping on the gloop. Mix science and storytelling by adding some toys – dinosaurs in a primordial swamp, or dolls in sinking sand? Cornflour washes off easily afterwards! The mixture doesn't behave as we'd expect, which prompts lots of curious questions. It's brilliant for experimentation and play, which are really the same thing!

- Follow Isabel on Facebook @STEMagineering for more hands-on activity ideas, or check out her books Self-Destructing Science, Animal Activity and What on Earth? Water and Wind.
- The University of Oxford's Parents for STEM Futures project is creating a print and digital resource to help parents of primary-aged children explore science and science careers at home, through engaging hands-on activities.
- Exploratorium, based in California, USA, is trying to change the way science is taught. Their website is full of exciting activity ideas.
- Play by the book creates awesome hands-on activities based on children's books, including books about or inspired by science.
- British Science Week produce excellent activity packs each year, with ideas you can try at home. Remember to browse activity packs from previous years too.
- Whizz Pop Bang is a monthly science magazine for children aged 7 to 11, and features hands-on activities every month.

Written by Isabel Thomas

I live in Cambridge, where I'm a primary school governor and zookeeper to three young sons. In the last ten years I've written more than 130 books for children and young people including *How to Change the World*, shortlisted for the Royal Society Young People's book Prize 2016. I also write for the

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