

# Chemistry - not magic, but magical

Business depends on a supply of young people interested in careers in the chemical industry. Chemistry with Cabbage delivers hands-on workshops for 200 schools in the North West. We do fun, simple experiments that get children interested in science. Fill a bottle with water, put a card on top and you can turn it over without losing a drop. Hang a fork on a piece of string and “ting” it against a glass. Then put your fingers in your ears – the difference is astounding – it sounds like Big Ben.

Young children will often say “that’s magic”. It is magical, but it is not magic – there’s a major difference. With a magic trick as soon as you know how it’s done it’s not interesting anymore. In chemistry, the more you understand it, the more interesting it gets.

Children learn a lot of science from the television, which is brilliant, but I hate to see chemistry portrayed as flashes, bangs and explosions. You might as well just light fireworks. If they think studying chemistry is going to be one explosion after another they are going to have a nasty shock. Real research is serious stuff, repeating experiments over and over again. We have to get kids interested in the subject, not just the effects.

It's all about encouraging a sense of wonder in the small stuff, the things that happen every day. Newton wasn't the first person to be hit on the head by an apple. His genius was that he thought deeply about what must be happening.

Let me give you a more recent example. Nanotechnology has applications from electronics to medicine. It's all about the way that particle size affects the way chemicals behave. But this is not new - everyone who cooks knows about this phenomenon. Icing sugar is exactly the same as granulated sugar except for its particle size. Whizz granulated sugar in a food processor and you get icing sugar, but the two behave quite differently. You can't make icing with granulated sugar; it just dissolves in the water. By contrast

it's difficult to get icing sugar to dissolve because of the surface effects of its tiny particle size. I've known that for years, as has anyone who has ever done any baking. Why didn't we get the Nobel prize? Because we didn't think about it. It took chemists at Manchester University to put serious thought into what was happening.

Chemistry with Cabbage workshops are all about getting children to think about what is going on in very ordinary, everyday things. One of my favourite demonstrations is making a Lardberg – melting lard and then dropping some solid lard in and showing the difference between that and an iceberg. Ice floats on water and most people don't realise how strange that is. H<sub>2</sub>O is the only chemical that we come across in solid, liquid and gaseous form. We don't see liquid oxygen, solid alcohol or calcium gas, so we are not familiar with the way they behave. Every other chemical behaves very differently to water. If you freeze oil and drop it into liquid oil, it sinks. Melt lard and drop in a spoonful



of solid lard - it sinks. All chemicals sink in their own liquid because as they get colder the molecules get closer together and it gets denser. All chemicals except water, which behaves very strangely indeed. The really interesting thing about this is that life depends on water being so peculiar. If ice sank in water, as every other solid does in its own liquid, all the lakes would freeze in the winter. The fish would die, animals that rely on fish would die.

It is contemplating the wonder of very ordinary things that we try to encourage in young children.

**You can be part of this. Contact Lorelly Wilson -**  
**[lorelywilson@gmail.com](mailto:lorelywilson@gmail.com)**

