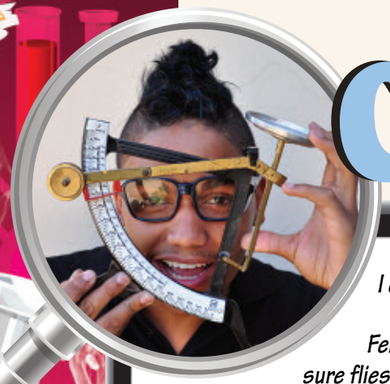
EASY SCIENCE

Kyle Explores the History of Chemistry!

By Helene Share

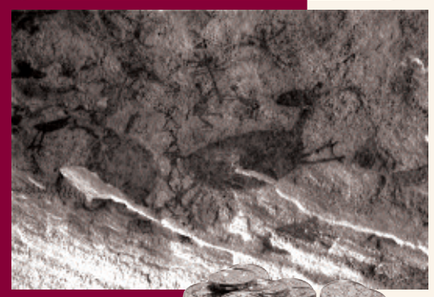


Hello, hello! I can't believe it is already February. Time sure flies when you're having fun. As you all know, 2011 is the year of chemistry, but what is chemistry? Where did it all start?

Chemistry is the study of matter. Matter is everything around us – things we can see and some we cannot see. Matter can be solids, liquids or gases. In chemistry we study properties of matter and also do experiments to find out how substances react with each other. Chemistry is used all around us, every day!

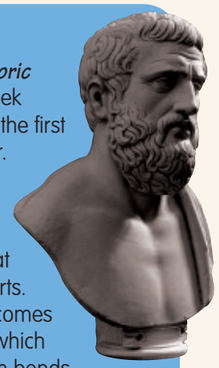
20 000 Years ago

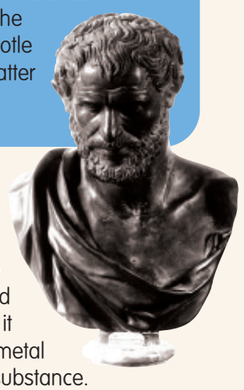
The first time chemistry was used, believe it or not, was in prehistoric times. During this time, humans stayed in caves and couldn't even talk to each other. They communicated using hand signals and sounds. Fire was discovered by prehistoric men and they were able to find and use coloured minerals to paint animals and hunting scenes on the walls of their caves. They used chemistry and didn't even know it!



The Greeks

500 to 300 B.C. is called the *Historic Age* or *Hellenistic period.* The Greek philosophers and scientists were the first to investigate the nature of matter. Democritus, who lived between 460 and 370 B.C., had a very modern theory about matter that said it consists of tiny particles that cannot be broken into smaller parts. He called these particles atoms (comes from the Greek word "a-tomos", which means "not divisible.") Atoms form bonds between each other. This was the first real sign of chemistry! Aristotle (384 - 322 B.C.) investigated matter by using the four elements: water, fire, air and earth.

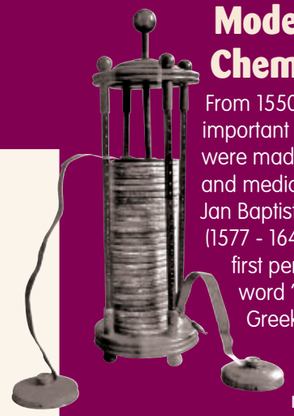




Alchemy

At the end of the Hellenistic period, alchemy started to develop in Egypt. People who practiced alchemy were called alchemists and they believed it was possible to change any metal into gold, by using a certain substance. In the Middle Ages, this wonderful substance was called the "philosophers' stone." We all know it is impossible to turn any metal into gold! Haha!

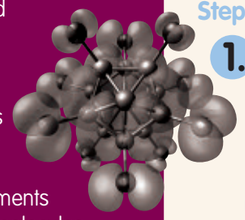
But not everything in the middle ages was based on magic experiments. A lot of chemical processes were discovered, like the distillation (a separation process using different boiling points of liquids) and fermentation (natural formation) of alcohol; techniques to make cosmetics and dyes from herbs; and the invention of "black powder" or gun powder. This remained the only explosive for a long time, until dynamite was invented at the end of the 14th century.



Modern Chemistry

From 1550 to 1650, very important discoveries were made in the mining and medicine industries. Jan Baptist Van Helmont (1577 - 1644) was the first person to use the word "gas" (from the Greek word "chaos" meaning shapeless matter.)

During the second half of the 17th century modern chemistry, the way we know it, was born. Robert Boyle investigated gases and agreed that matter consists of atoms and that elements exist.



The 18th century was also very important for the development of chemistry. The first elements were discovered and molecules (combined atoms) were produced. Here are a few examples of what was done during this time:

- Joseph Black (1728 - 1799) studied carbon dioxide (CO_2)
- Henry Cavendish (1731 - 1810) produced water by burning hydrogen gas in air.
- Joseph Priestley (1733 - 1804) and Karl Wilhelm Scheele (1742 - 1786) identified and purified oxygen (O_2).

During this century, new chemical elements were often discovered, as well as their properties investigated. This century ended with the invention of the first battery, built by the Italian, Alessandro Volta, who also discovered methane gas (CH_4) – the "gas of swamps."

Wow, I never knew that chemistry has been around for so long. I now understand why it is soooo important!

Colour-changing Cabbage!

Here is a fun experiment that you can try at home, using dyes and colours of vegetables.

Stuff you need:

- head of red cabbage
- medium sized bowl
- grater
- cold water
- strainer
- plastic container
- clear plastic cups or glasses
- bicarbonate of soda
- liquids to test like lemon juice, vinegar or cola.

Steps to follow:

1. Check with a grown up before you begin!
2. Grate some red cabbage into a medium sized bowl.
3. Cover the cabbage with cold water and leave it to stand for 45 minutes.
4. Strain the water, which should have changed colour, into a plastic container.
5. Divide equal amounts of cabbage juice into four plastic cups.
6. Add one teaspoon of baking soda to all but one of the cups. The baking soda (which is a base) should turn your cabbage juice blue.
7. Now, test the different liquids to see how much of each it takes to turn the cabbage juice back to its original colour. You can check this against the glass into which you did not add baking soda, but remember to add the liquid you are testing one teaspoon at a time to get the best result.

Red cabbage juice contains chemicals that cause it to change colour when it is mixed with certain substances. The cabbage juice will turn shades of red when mixed with acids, and shades of blue when mixed with bases. So, have fun testing different liquids!

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