Fun Facts

A noble gas

For many years it was thought that the noble gases where chemically inactive. In 1962 Dr. Neil Bartlett treated xenon gas with the powerful fluorinating agent, PtF_6. A yellowish- orange solid compound formed. This compound contained platinum, fluorine and.... YES xenon. This was the first inert gas compound ever formed! This discovery was made while Dr. Bartlett was a chemistry professor at the University of British Columbia between the years 1958 and 1966.

Why sugar rots your teeth

The truth is that it is not actually the sugar that rots your teeth. It is the plaque and sugar combination that does the dirty deed. Plaque is a collection of bacteria that adheres to your teeth and gets its energy by breaking down the sugars you eat. During sugar breakdown, many products are formed, one of which is lactic acid which decreases the pH in your mouth. In an acidic environment, the hard enamel that protects your teeth dissolves, which leaves your teeth vulnerable to decay and cavities. The saliva (average pH 6.8) in your mouth counteracts this decrease in pH by using buffers such as bicarbonate ion (HCO) and the COOH and NH groups of proteins. However, the time it takes for the saliva to neutralize the acid depends on the amount of sugar that has been ingested. Therefore, the more sugar that is available, the more the bacteria multiply, the lower the pH in your mouth becomes, and the longer your teeth are susceptible to decay.

Why the leaves change colour in the different seasons

Within all leaves there are molecules called pigments that are responsible for their colours. These molecules are present at all times; however, whether or not a particular colour dominates is dependent on the amount of pigment present. The relative amounts of pigments are governed by conditions such as temperature, rainfall, and length of day. In the spring and summer, when the temperature is warm and the days are long, the green pigment called chlorophyll is present in the largest quantity; hence the leaves are green. On the other hand, in the autumn, when the temperature gets cooler and the days get shorter, the chlorophyll diminishes, allowing the carotenoids to show their true colours, their yellow pigment. In addition, there are pigments called anthocyanins that are responsible for the red and purple hues in the autumn leaves.

How the morning glory flower changes its colour from purplish red buds to give flowers with blue petals

Remarkably, it is the change in pH that is responsible for the changing colours in the morning glory flower. The colours we see are due to pigments, just like in leaf colour. However, in this case, one pigment called heavenly blue anthocyanin (HBA) portrays two different colours when the pH shifts from a slightly acidic to a slightly basic environment. In a laboratory experiment, when flowers are exposed to CO gas, HBA finds itself in an acidic (pH 6.6) medium which causes the protonated pigment to reflect a purplish red hue. On the other hand, when the flower petals are returned to an atmosphere containing O, the medium becomes basic (pH 7.7) and this same pigment becomes deprotonated and reflects a blue tone. Hence, acid-base chemistry is responsible for the purplish red buds and the blue flowers.

Making paper from Ground Wood Fibre

Did you know that a process for making paper that is used today was discovered by a Canadian? Charles Fenerty, from Nova Scotia, developed the idea of making paper from ground wood fibre after he watched wasps build nests out of finely chewed wood fibre. In 1838 Fenerty produced the first usable newsprint made from ground wood fibre. At this time, most of the paper was made with rags which were decreasing in availability as the demand for paper was increasing. Thus, alternative paper making methods were needed. Fenerty's method for making paper was very important because it used the abundant supply of trees. It also helped start the pulp and paper industry which is Canada's largest source of manufacturing, employment, export, and international trade.

A career in chemistry

The time taken to earn a BSc in chemistry or chemical engineering is 4 years. A Diploma in Chemical Technology takes 2 years. A shortage of professionals in these fields is predicted within a few years. The National Research Council - the principal science and engineering organization of the government of Canada - employs more than 400 chemists, chemical engineers and chemical technologists in laboratories across the country. They study everything from high temperature superconductors, to ways to make plants more stress tolerant, to new processes to reduce discharge of harmful substances into the environment.