



CHANGE OF STATE

WHENEVER a substance changes it is said to undergo a "change of state". It can occur when motion, temperature (heating or cooling) or pressure is applied. In the kitchen these changes occur between three states of matter – solid, liquid and gas. These changes in state are physical changes, not chemical. The substances remain chemically the same. For example water is always H_2O whether it is ice, water or steam. Changes in state occur because energy is either added or removed affecting the way the particles interact with each other. The most common changes in cooking are:

- **Melting** – this process occurs when a solid is heated and turns to liquid. The temperature at which this occurs is called the melting point of the substance.
- **Boiling** – this process occurs when particles in a liquid become free and fast moving and turn into a gas. The temperature at which this occurs is called boiling point.
- **Condensation** – this process occurs when a gas is cooled and its particles stop moving so fast that a liquid forms.
- **Freezing or solidification** – this process occurs when a liquid is cooled and the particles in the liquid stop moving about and form a solid.
- **Evaporation** – this process occurs when the particles in a liquid pass directly into the gas state at a temperature below the boiling point of the liquid.

DID YOU KNOW?

- **MELTING** and dissolving are not the same. In melting one substance is involved. The liquid and solid are the same material. Heat is needed for melting. Dissolving involves two materials. The resulting solution is a mixture of both. The dissolved substance is present in the solution.
- When one material is mixed in another and its particles seem to disappear, the substance is soluble. A soluble solid dissolves to form a mixture called a solution, an insoluble substance does not.
- The difference between a chemical change and a physical change is that chemical change produces a new substance while in a physical change only the form changes.



COOKING UP CHEMISTRY

HAVE you ever baked a cake?

You mix ingredients in a particular order, put the mixture in a tin, pop it into the oven, cook it at a set temperature for a period of time and then eat it. This is a good example of chemistry where you put elements together according to a chemical equation to get a desired result.

Chemistry is the science that deals with different kinds of matter, their properties and uses, the changes in which matter undergoes these changes and the conditions that influence them. Let's get cooking and investigate how various materials form different substances – it's all about cooking up some chemistry in the kitchen.

COOKING UP A STORM

FOOD and drink are made up of chemical elements such as carbon, hydrogen, oxygen, nitrogen, sodium, calcium, sulphur and iron.

Cooking is a great way to study the physical and chemical properties and

changes that occur when working with food. See what happens when you heat, cool or mix substances in the kitchen.

By using your senses notice changes in physical traits like colour, size, odour and taste of the ingredients you are working with. This is because chemical properties of food can cause specific behaviours during chemical reactions.

Cooking is a great example of how one or more reactants are changed into different products. Start with a substance then add variables that change the outcome or product. Famous British chef, Heston Blumenthal, has taken kitchen chemistry to a new level with books and TV programs based on his scientific approach to cooking.

It's all in the chemistry!



NATIONAL SCIENCE WEEK

NATIONAL Science Week is an annual nationwide celebration of Australian achievements and capabilities in science.

This year it runs until August 21 and aims to increase community awareness

and understanding of the role of science, engineering, technology and innovation in maintaining and improving our society, economy and the environment.

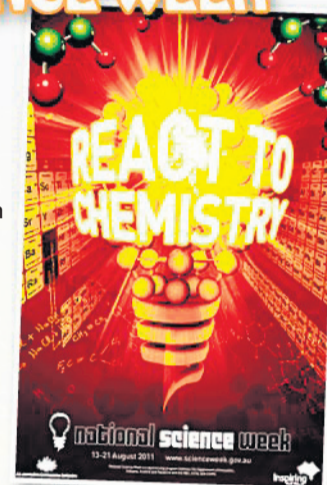
In celebrating the contributions of Australian scientists, National Science Week, encourages interest in scientific pursuits and inspires people to become fascinated by the world in which we live. Through events and activities, it showcases modern explorations which make science interesting, challenging and of direct relevance to our daily lives.

Each year a National Science Week theme for schools is chosen to encourage younger people to consider continuing studies in science, to connect science studies and science-based careers and to assist teachers to focus and plan ways to engage students in science activities.

The schools' theme for 2011 is "React with Chemistry" in line with the International Year of Chemistry.

Go to your newspaper's website. You should find the address on the front page.

Look for the NiE logo in the menu bar and click! This will link you to our new look NiE webpage.



NEXT WEEK: BOOK WEEK