

# Glossary

**acid** A substance that tastes sour, conducts electricity, and reacts with many metals. Lemon juice is an acid. It tastes sour, conducts electricity, and reacts with certain metals, such as iron.

**atom** The smallest particle of an element that has the properties of the element. An oxygen atom is the smallest particle of oxygen that has oxygen's properties. If you divide this atom, you have smaller particles, but they don't have oxygen's properties.

**atomic number** The number of protons contained in an atom of an element. An atom of iron contains 26 protons, so the atomic number of iron is 26. Atomic number is used in identifying atoms.

**base** A substance that tastes bitter and feels slippery. Soap is a base. It tastes bitter and feels slippery.

**boiling point** The temperature at which a liquid becomes a gas. Boiling point is a property that is different for each substance. The boiling point of oxygen is low because oxygen is a gas at room temperature.

**chemical reaction** The reaction of one or more substances to produce a new substance with different properties. The signs that a chemical reaction has occurred include temperature change, formation of a gas or a solid, and change in odor or color. For example, when an egg fries, you know a chemical reaction occurs because the color and odor of the egg change.

**compound** A pure substance that contains atoms of different elements. Water is an example of a compound. A molecule of water contains two hydrogen atoms and one oxygen atom.

**conductivity** A property that shows how easily heat or electricity flows through matter. Metals are good conductors because both heat and electricity flow easily through metals. Plastic and glass have poor conductivity because heat and electricity don't flow easily through them.

**constant** A factor that doesn't change in an experiment. Suppose you do an experiment to find out the effect of water on the growth of plants. The only factor you would change in the experiment would be the amount of water the plants receive. All other factors, such as the amount of sunlight the plants receive, the original size of the plants, and the type of soil the plants are grown in, must stay the same, or constant.

**dependent variable** The variable that changes as a result of changing the independent variable in an experiment. In the plant experiment (see definition for *constant*), the dependent variable is the height of the plant at the end of the experiment. This factor changes according to how the independent variable (the amount of water) changes.

**element** A pure substance made of only one type of atom. Copper, helium, calcium, and neon are all types of elements. Each element is made up of one kind of atom. A copper atom is different from a gold atom.

**group** A column on the periodic table. The elements in a group on the periodic table have similar properties. For example, fluorine and chlorine are in the same group. Both elements tend to react with the same elements and are gases at room temperature.

## Glossary (continued)

**independent variable** The factor in an experiment that is changed. In the plant experiment (see definition for *constant*), the independent variable is the amount of water the plants receive. This factor is the only one that changed during the experiment.

**indicator** A substance that changes color with a change in pH. Phenol red is an example of an indicator. Phenol red is yellow in an acid, red in a base, and orange in a neutral solution.

**melting point** The temperature at which a solid becomes a liquid. An icy road becomes wet when the temperature of the road rises to the melting point of water. Melting point is the same temperature as the freezing point, where a liquid becomes a solid.

**mixture** A combination of two or more substances that can be separated by physical means. Bird seed is a mixture. You can separate the mixture into the different types of seeds it contains. A saltwater solution is a mixture, too. The salt can be separated from the water by evaporating the water. Both these methods of separation are physical methods because the identity of the items separated does not change.

**molecule** The smallest particle of a compound. The chemical formula of the compound carbon dioxide ( $\text{CO}_2$ ) shows that a molecule of carbon dioxide contains one atom of carbon (C) and two atoms of oxygen (O).

**monomer** A small molecule that joins other small molecules to make a polymer. Proteins are made up of small molecules called amino acids. Amino acids are the monomers that make up proteins. Sometimes you can tell the name of the monomer from the name of the polymer formed. For example, *polyethylene* (used in plastic bags and plastic wrap) is a polymer formed from ethylene monomers.

**period** A row on the periodic table. Elements in a period on the periodic table change in properties as you go across the row from left to right. But when you reach the end of a row and start the next row, the properties of the elements start over in a pattern like the row above it.

**periodic table of the elements** A chart that shows all the elements arranged by atomic number and by properties. The periodic table was developed by the Russian chemist Dmitri Mendeleev. The chart shows all the known elements on Earth. The elements are arranged according to their atomic numbers and their properties.

**pH** A measure of the amount of acid in a solution. A low pH means a solution is acidic. Stomach acid has a pH of about 2. A high pH means a solution is basic. Ammonia solution used for cleaning is a base and has a pH of about 11.

**polymer** A large molecule made from chemical reactions between many small molecules. *Poly* means “many.” When many monomers react with each other, they form a polymer. A polymer can contain just a few monomer units, or it can contain tens of thousands of them. Carbohydrates such as cellulose and starch are polymers of certain sugars, which are monomers.

**product** A substance formed during a chemical reaction. When a piece of paper burns, ash, carbon dioxide, and water are products. Rust is the product of the chemical reaction between iron and oxygen. When plants make food, sugar and oxygen are the products.

**property** A characteristic of matter that can be used to identify it. If you described water, you might say that it is a colorless, odorless liquid. You might mention its melting point and boiling point. All these characteristics are properties of water.

## Glossary (continued)

**reactant** A substance going into a chemical reaction. When a piece of paper burns, the paper and the oxygen in the air are reactants. If either reactant is missing, the reaction will not happen. Iron and oxygen are reactants when rust forms, and carbon dioxide and water are reactants when plants make food.

**salt** The product of a chemical reaction between an acid and a base. When an acid combines with a base, a salt and water are produced. For example, when hydrochloric acid (stomach acid) and the base sodium hydroxide (lye) react, the products are water and sodium chloride, table salt.

**solubility** A measure of how easily one substance dissolves in another substance. When you add sugar to iced tea, the sugar dissolves. If you keep adding sugar, eventually no more sugar dissolves. The amount of sugar dissolved at this time and the volume of tea can be used to find the solubility of sugar in water.

**solution** A mixture in which one substance is spread out so evenly in another substance that you can't tell the substances apart. Sugar dissolved in water is a solution. The sugar molecules are evenly spread throughout the water. The sugar and water molecules are so small, you can't tell them apart.

**surface tension** The force acting on the molecules at the surface of a liquid that causes the liquid to form rounded drops. Surface tension is a force between molecules. It is what allows some insects to move across the surface of a pond without falling in.

**suspension** A mixture in which solid particles are suspended in a liquid. After a rain, a pond might look muddy instead of clear. Mud particles are larger than water molecules, so these particles and water don't form a solution. They form a suspension. After a while, the particles will settle out of the water.