

Matter and Change

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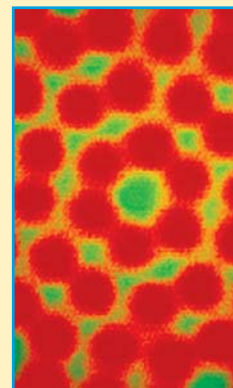
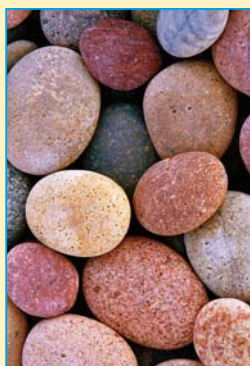
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Glossary

A page number in boldface type indicates the page on which the word is defined in the text.

acid compound that releases hydrogen ions (H^+) in water, giving it a pH below 7 (**20**)

activation energy smallest amount of energy needed to start a chemical reaction (**18**, **19**)

atom smallest particle of an element that still has all the properties of that element (**2–8**, **10**, **17**, **18**, **21**)

atomic number number of protons in the nucleus of an atom (**3**, **4**)

atomic theory idea that all matter is made of atoms (**22**)

base compound that releases hydroxide ions (OH^-) in water, giving it a pH above 7 (**20**)

boiling point temperature at which a liquid turns to a gas (**11**, **12**, **14**)

brittle easily breakable (**13**)

catalyst substance that speeds up a chemical reaction, but is not changed during the reaction (**19**)

chemical bond force that holds two or more atoms together (**6**, **18**)

chemical change change in matter that forms one or more new substances, also called *chemical reaction* (**17**)

chemical equation symbols that show how matter changes during a chemical reaction, for example: $2H_2 + O_2 \rightarrow 2H_2O$ (**18**)

chemical formula group of symbols that shows the makeup of a compound, for example: NaCl (sodium chloride, or common table salt) (**6**, **8**)

chemical property property of a substance that can be used to identify it and that describes how that substance reacts with other substances (**16**, **20**)

chemical reaction change in matter in which two or more elements or compounds (reactants) combine to form different compounds or elements (products); also see *chemical change* (**17–19**, **21**)

colloid mixture whose properties are between those of a solution and a suspension; particles are not dissolved, but do not settle out (**15**)

combustibility substance's ability to burn (**16**)

compound substance that is made of two or more elements that are chemically joined together and has properties different from those of the elements that make it up (**6–9**, **16**, **17**, **20**)

concentration amount of solute in a solution compared with the amount of solvent (**15**, **19**, **20**)

conduction transfer of thermal energy through particles of matter that are in direct contact (**11**)

conductivity ability of a material to convey or conduct heat and electricity (**13**)

convection transfer of thermal energy by the motion of fluids (**11**)

corrosive able to “eat away” or break down materials such as metal or living matter (**20**)

covalent bond type of bond between atoms in which electrons are shared (**7**, **8**)

decomposition decay of a substance; the breakdown of a substance into simpler substances (**19**)

density measurement of the mass per unit volume of a substance (**13**, **14**)

dissolve to spread evenly throughout another substance (**15**, **17**)

ductile able to be drawn out into a wire without breaking (**13**)

electron negatively charged particle that is the smallest of the three main particles that make up an atom (**2–7**, **10**)

element substance that cannot be broken down chemically into simpler substances and is made up of only one type of atom (**4–6**, **8**, **16**, **21**)

endothermic reaction reaction in which energy is absorbed (**18**)

enzyme catalyst produced by living things that speeds up chemical reactions (**19**)

exothermic reaction reaction in which energy is given off (**18**)

fluid substance that flows freely, such as a liquid or a gas, and takes the shape of its container (**10**, **11**, **14**)

gas state of matter that has neither a definite shape nor a definite volume (**4–9**, **10–12**, **14**, **16**, **17**)

hardness ability to resist being scratched (**13**)

heat transfer movement of thermal energy from one place or material to another until both reach the same temperature (**11**)

heterogeneous made of substances that do not mix together evenly (**15**)

homogeneous made of two or more substances that mix together evenly (**15**)

hydrocarbon simplest type of organic compound, containing only hydrogen and carbon (**8**)

hydrogen ion hydrogen atom that loses its one electron and becomes a positive ion (H^+) (**20**)

hydroxide ion negative ion made of hydrogen and oxygen (OH^-) (**20**)

indicator substance that changes color in the presence of an acid or base (**20**)

inhibitor substance that slows down a chemical reaction (**19**)

ion charged particle formed when an atom gains or loses one or more electrons (**6**, **10**, **20**)

ionic bond type of bond that forms when electrons are transferred from one atom to another (**6**)

isomer compound that has the same chemical formula as another compound, but has a different molecular structure and shape (**8**)

isotope atoms of the same element that have different numbers of neutrons (3)

kinetic theory of matter theory stating that the particles that make up all matter are constantly moving (9)

law of conservation of mass law that states that matter cannot be created or destroyed during chemical reactions (17, 18)

liquid state of matter that has a definite volume but not a definite shape (5, 9, 10–14, 16)

magnetic ability to attract a magnet (13)

malleable able to be hammered into thin sheets (13)

mass amount of matter in an object (2–4, 13, 14, 17, 18)

mass number sum of the protons and neutrons in an atom (3)

matter anything that has mass and takes up space (2, 9–11, 13, 14, 17, 20)

melting point temperature at which a solid becomes a liquid (11, 12, 14)

metal element that is usually shiny, is a good conductor of heat and electricity, and can be hammered into different shapes or drawn into a wire (5, 6, 13, 16, 19, 20)

metallic bond bond in which a network of positively charged metal ions is surrounded by a sea of negatively charged electrons (6)

metalloid elements that have some properties of both metals and nonmetals (5)

mixture two or more substances that are mixed together but are not chemically joined (3, 10, 14, 15, 17)

molecule smallest unit of a compound that can exist alone and still show the properties of that compound (7, 8, 11, 12, 15, 18, 19)

neutralization reaction reaction between an acid and a base that produces water and a salt (20)

neutron particle with no charge that is part of the nucleus of an atom (2, 3, 22)

noble gas inert or unreactive element in Group 18 of the periodic table (5, 16)

nonmetal element that is not shiny, usually does not conduct heat or electricity well, and cannot be pounded into different shapes or drawn into a wire (5, 16, 20)

nucleus central part of an atom that is made of protons and neutrons (2–4, 21)

organic compounds most covalent compounds that contain carbon (8)

periodic table table in which elements are arranged in order of increasing atomic number (4, 16, 19)

pH measure of the concentration of hydrogen ions in a solution (20)

physical change change in an object's appearance, but not in its composition (14)

physical property feature of matter that can be observed or measured without changing the chemical makeup of a substance (13)

plasma state of matter that is a very hot mixture of ions and electrons (9, 10)

polar molecule molecule with covalently bonded atoms that share electrons unequally (7)

precipitate insoluble solid that forms as a product of a chemical reaction (17)

product new substance produced in a chemical reaction (17–20)

proton particle with a positive charge that is part of the nucleus of an atom (2–4, 6)

radiation transfer of thermal energy by electromagnetic waves (11, 21)

radioactive composed of atoms whose nuclei naturally give off high-energy particles and rays (21)

rate of reaction how fast a chemical reaction happens (19)

reactant substance that changes, or reacts, in a chemical reaction (17–19)

reactivity how easily a substance reacts with other substances (16)

salt ionic compound that contains metal and nonmetal ions; product of a reaction between an acid and a base (6, 20)

saturated solution solution in which no more solute will dissolve at that temperature (15)

solid state of matter that has a definite shape and a definite volume (5, 9, 10–15, 17)

solubility how much solute will dissolve in a certain amount of solvent at a certain temperature (15)

solute substance that dissolves in a solvent to form a solution (15)

solution homogeneous mixture in which particles of one substance are spread evenly throughout the other substance (15, 20)

solvent substance in which a solute dissolves to form a solution (15)

stability not usually reacting with other substances (16)

subatomic smaller than an atom (2, 3)

sublimation changing directly from a solid to a gas (14)

suspension heterogeneous mixture in which particles of a substance are temporarily mixed in a liquid (15)

temperature measure of the average kinetic energy of the particles in a sample of matter (5, 9–12, 14, 15, 19)

thermal expansion process by which thermal energy causes substances to increase in size, or expand (11)

unsaturated solution solution that can dissolve more solute (15)

valence electron electron in an atom's outermost shell or energy level (3–7)

volume amount of space an object takes up (10, 13, 14)

weight measure of the force, or pull, on objects due to gravity (13)