

Science

Year 5	Vocab	Year 6	Vocab
<p>THE HUMAN BODY: CIRCULATORY AND RESPIRATORY SYSTEMS</p> <p>A. THE CIRCULATORY SYSTEM</p> <ul style="list-style-type: none"> Pioneering work of William Harvey Heart: four chambers (atrium/atria or atriums [plural] and ventricle/ventricles), aorta Blood Red blood cells, white blood cells, platelets, haemoglobin, plasma, antibodies Blood vessels: arteries, veins, capillaries Blood pressure, pulse Filtering function of liver and spleen Fatty deposits can clog blood vessels and cause a heart attack. Blood types (four basic types: A, B, AB, O) and transfusions <p>B. THE RESPIRATORY SYSTEM</p> <ul style="list-style-type: none"> Process of taking in oxygen and getting rid of carbon dioxide Nose, throat, voice box, trachea (windpipe) Lungs, bronchi, bronchial tubes, diaphragm, ribs, alveoli (air sacs) Smoking: damage to lung tissue, lung cancer 	<p>Circulatory Respiratory Heart Atrium Ventricle Aorta Blood White/Red blood cells Platelets Haemoglobin Plasma Antibodies Vessels Arteries Veins Capillaries Blood pressure Pulse Liver spleen Blood types – A, B, AB, O Transfusion</p> <p>Breathe Oxygen Carbon Dioxide Exhale Nose Throat Voice box Trachea Lungs Bronchi Broncheal tubes Diaphragm Ribs Alveoli Smoking Lung Cancer</p>	<p>PLANT STRUCTURES AND PROCESSES</p> <p>A. STRUCTURE: NON-VASCULAR AND VASCULAR PLANTS</p> <ul style="list-style-type: none"> Non-vascular plants (for example: algae) Vascular plants Vascular plants have tube-like structures that allow water and dissolved nutrients to move through the plant Parts and functions of vascular plants: roots, stems and buds, leaves <p>B. PHOTOSYNTHESIS</p> <ul style="list-style-type: none"> Photosynthesis is an important life process that occurs in plant cells, but not animal cells (photo = light; synthesis = putting together). Unlike animals, plants make their own food, through the process of photosynthesis. Role in photosynthesis of: energy from sunlight, chlorophyll, carbon dioxide and water, xylem and phloem, stomata, oxygen, sugar (glucose) <p>C. REPRODUCTION IN PLANTS</p> <ul style="list-style-type: none"> Asexual reproduction Example of algae Vegetative reproduction: runners (for example: strawberries) and bulbs (for example: onions), growing plants from eyes, buds, leaves, roots, and stems Sexual reproduction by spore bearing plants (for example: mosses and ferns) Sexual reproduction of non-flowering seed plants: conifers (for example: pines), male and female cones, wind pollination Sexual reproduction of flowering plants (for example: peas) Functions of sepals and petals, stamen (male), anther, pistil (female), ovary (or ovule) Process of seed and fruit production: pollen, wind, insect and bird pollination, fertilisation, growth of ovary, mature fruit Seed germination and plant growth: seed coat, embryo and endosperm, germination (sprouting of new plant), monocots (for example: corn) and dicots (for example: beans) 	<p>Non-Vascular Plants Vascular Plants Roots Stems Buds Leaves</p> <p>Photosynthesis Energy Sunlight Chlorophyll Carbon Dioxide Water Xylem Phloem Stomata Oxygen Sugar</p> <p>Asexual Algae Vegetative Spores Conifer Sepals Petals Stamen Anther Pistil Ovary Pollen Pollination Fertilisation Germination Monocots Dicots</p>
<p>CHEMISTRY: BASIC TERMS AND CONCEPTS</p> <p>A. ATOMS</p> <p>All matter is made up of particles too small for the eye to see, called atoms. Scientists have developed models of atoms; while these models have changed over time as scientists make new discoveries; the models help us imagine what we cannot see.</p> <ul style="list-style-type: none"> Atoms are made up of even tinier particles: protons, neutrons, electrons. <p>The concept of electrical charge</p> <ul style="list-style-type: none"> Positive charge (+): proton Negative charge (-): electron Neutral (neither positive or negative): neutron ‘Unlike charges attract, like charges repel’ (relate to magnetic attraction and repulsion) <p>B. PROPERTIES OF MATTER</p> <ul style="list-style-type: none"> Mass: the amount of matter in an object, similar to weight Volume: the amount of space a thing fills Density: how much matter is packed into the space an object fills Vacuum: the absence of matter <p>C. ELEMENTS</p> <ul style="list-style-type: none"> Elements are the basic kinds of matter, of which there are a little more than one hundred. There are many different kinds of atoms, but an element has only one kind of atom. Familiar elements, such as gold, copper, aluminium, oxygen, iron Most things are made up of a combination of elements. <p>D. SOLUTIONS</p> <p>A solution is formed when a substance (the solute) is dissolved in another substance (the solvent), such as when sugar or salt is dissolved in water; the dissolved substance is present in the solution even though you cannot see it. Concentration and saturation (as demonstrated through simple experiments with crystallisation)</p>	<p>Atoms Particles Protons Neutrons Electrons Positive Charge Negative Charge Neutral Charge</p> <p>Mass Volume Density Vacuum</p> <p>Periodic Table Matter Gold Copper Aluminium Oxygen iron</p>	<p>THE HUMAN BODY: HORMONES AND REPRODUCTION</p> <p>A. HUMAN GROWTH STAGES</p> <ul style="list-style-type: none"> Puberty Glands and hormones (see below, Endocrine System), growth spurt, hair growth, breasts, voice change <p>C. THE REPRODUCTIVE SYSTEM</p> <ul style="list-style-type: none"> Females: ovaries, fallopian tubes, uterus, vagina, menstruation Males: testes, scrotum, penis, urethra, semen 	<p>Hormones Reproduction Puberty Glands Growth spurt Hair Breasts</p> <p>Ovaries</p>
<p>ELECTRICITY</p>	<p>Charge of electrons</p>		

<p>Teachers: Through reading and observation, and <i>experiment</i>, examine the following:</p> <ul style="list-style-type: none"> Electricity as the charge of electrons Static electricity Electric current Electric circuits, and experiments with simple circuits (battery, wire, light bulb, filament, switch, fuse) Closed circuit, open circuit, short circuit Conductors and insulators Electromagnets: how they work and common uses Using electricity safely 	<p>Static Current Circuits Wire Lightbulb Filament Cell Switch Fuse Close/Open Short circuit Conductor Insulator Electro-magnets</p>	<ul style="list-style-type: none"> Sexual reproduction: intercourse, fertilisation, zygote, implantation of zygote in the uterus, pregnancy, embryo, foetus, newborn <p>C THE ENDOCRINE SYSTEM The human body has two types of glands: duct glands (such as the salivary glands), and ductless glands, also known as the endocrine glands.</p> <ul style="list-style-type: none"> Endocrine glands secrete (give off) chemicals called hormones. Different hormones control different body processes. Pituitary gland: located at the bottom of the brain; secretes hormones that control other glands, and hormones that regulate growth Thyroid gland: located below the voice box; secretes a hormone that controls the rate at which the body burns and uses food Pancreas: both a duct and a ductless gland; secretes a hormone called insulin that regulates how the body uses and stores sugar; when the pancreas does not produce enough insulin, a person has a sickness called diabetes (which can be controlled). Adrenal glands: secrete a hormone called adrenaline, especially when a person is frightened or angry, causing rapid heartbeat and breathing. 	<p>Fallopian tubes, Uterus, Vagina Menstruation, Testes, Scrotum, Penis, Urethra, Semen, Sexual Reproduction, Intercourse, Fertilisation, Zygote, Pregnancy, Embryo, Foetus, Newborn</p> <p>Endocrine Duct glands Ductless glands Secrete, hormones, pituitary gland, thyroid gland, pancreas (insulin), diabetes, adrenal</p>
<p>GEOLOGY</p> <p>A. THE EARTH'S LAYERS</p> <ul style="list-style-type: none"> Crust, mantle, core (outer core and inner core) Movement of tectonic plates Earthquakes Faults, San Andreas fault Measuring intensity: seismograph and Richter scale Tsunamis Volcanoes Magma Lava and lava flow Active, dormant and extinct Famous volcanoes: Vesuvius, Krakatoa, Mount St. Helens Hot springs and geysers: Old Faithful (in Yellowstone National Park, US) Theories of how the continents and oceans were formed: Pangaea and continental drift <p>B. HOW MOUNTAINS ARE FORMED</p> <ul style="list-style-type: none"> Folded mountains, fault-block mountains, dome-shaped mountains <p>C. ROCKS</p> <ul style="list-style-type: none"> Formation and characteristics of metamorphic, igneous, and sedimentary rock <p>D. WEATHERING AND EROSION</p> <ul style="list-style-type: none"> Physical and chemical weathering Weathering and erosion by water, wind and glaciers The formation of soil: topsoil, subsoil, bedrock 	<p>Crust Mantle Core Tectonic plates Earthquakes Fault (San Andreas) Seismograph Richter Scale Tsunami Volcano Magma Larva Active, dormant and extinct Continental drift Pangaea</p> <p>Folded Fault-block Dome-shaped</p> <p>Metamorphic Igneous Sedimentary</p> <p>Weathering Erosion Physical Chemical Water, wind and glacier erosion Formation Soil Topsoil Subsoil Bedrock</p>	<p>LIFE CYCLES AND REPRODUCTION</p> <p>A. THE LIFE CYCLE AND REPRODUCTION</p> <ul style="list-style-type: none"> Life cycle: development of an organism from birth to growth, reproduction, death <ul style="list-style-type: none"> Example: Growth stages of a human: embryo, foetus, newborn, infancy, childhood, adolescence, adulthood, old age All living things reproduce themselves. Reproduction may be asexual or sexual. <ul style="list-style-type: none"> Examples of asexual reproduction: fission (splitting) of bacteria, spores from mildews, moulds, and mushrooms, budding of yeast cells, regeneration and cloning Sexual reproduction requires the joining of special male and female cells Vegetative reproduction: runners (for example: strawberries) and bulbs (for example: onions), growing plants from eyes, buds, leaves, roots, and stems Sexual reproduction by spore bearing plants (for example: mosses and ferns) Sexual reproduction of non-flowering seed plants: conifers (for example: pines), male and female cones, wind pollination Sexual reproduction of flowering plants (for example: peas) <ul style="list-style-type: none"> Functions of sepals and petals, stamen (male), anther, pistil (female), ovary (or ovule) <ul style="list-style-type: none"> Process of seed and fruit production: pollen, wind, insect and bird pollination, fertilisation, growth of ovary, mature fruit Seed germination and plant growth: seed coat, embryo and endosperm, germination (sprouting of new plant), monocots (for example: corn) and dicots (for example: beans) <p>B. SEXUAL REPRODUCTION IN ANIMALS</p> <ul style="list-style-type: none"> Reproductive organs: testes (sperm) and ovaries (eggs) External fertilisation: spawning Internal fertilisation: birds, mammals Development of the embryo: egg, zygote, embryo, growth in uterus, foetus, newborn <p>C. REPRODUCTION IN PLANTS</p> <ul style="list-style-type: none"> Asexual reproduction <ul style="list-style-type: none"> Example of algae 	<p>Reproduction Organism Asexual Regeneration Cloning Fission Bacteria Pollination Germination Monocots Dicots</p> <p>Testes, Ovaries, Fertilisation, Embryo, Egg, Zygote, Uterus, Foetus, newborn</p>
<p>METEOROLOGY</p> <p>The water cycle (review from Year 3): evaporation, condensation, precipitation</p> <ul style="list-style-type: none"> Clouds: cirrus, stratus, cumulus (review from Year 3) The atmosphere Troposphere, stratosphere, mesosphere, thermosphere, exosphere How the Sun and the Earth heat the atmosphere Air movement: wind direction and speed, prevailing winds, air pressure, low and high pressure, air masses Cold and warm fronts: thunderheads, lightning and electric charge, thunder, tornadoes, hurricanes Forecasting the weather: barometers (relation between changes in atmospheric pressure and weather), weather maps, weather satellites. <p>Weather and climate: 'weather' refers to daily changes in temperature, rainfall, sunshine, etc., while 'climate' refers to weather trends that are longer than the cycle of the seasons.</p>	<p>Water cycle Evaporation Condensation Precipitation Clouds Cirrus Stratus Cumulus Atmosphere Troposphere Stratosphere Mesosphere Thermosphere Exosphere Wind Prevailing Air pressure (low/high) Air Masses Fronts Occluded Thunder heads Lightning Tornadoes Hurricanes Barometer Weather map Satellite Climate</p>	<p>CHEMISTRY: MATTER AND CHANGE</p> <p>A. ATOMS, MOLECULES, AND COMPOUNDS</p> <ul style="list-style-type: none"> Basics of atomic structure: nucleus, protons (positive charge), neutrons (neutral), electrons (negative charge) 	<p>Atoms, molecules, compounds Nucleus, protons, neutrons and electrons Shells Compounds</p>
<p>EVOLUTION</p> <ul style="list-style-type: none"> Animals have offspring that are of the same kind but often offspring have different appearances 	<p>Life cycle Offspring</p>		

<ul style="list-style-type: none"> Animals and plants have adapted to suit the environment within which they live Adaptation may lead to evolution: Darwin's finches 	<p style="text-align: center;">Adapt Darwin</p>	<ul style="list-style-type: none"> Atoms are constantly in motion, electrons move around the nucleus in paths called shells (or energy levels) Atoms may join together to form molecules or compounds. Common compounds and their formulas: <ul style="list-style-type: none"> Water H₂O Salt NaCl Carbon Dioxide CO₂ 	<p style="text-align: center;">Formulae (Water: H₂O, Salt: NaCl & Carbon Dioxide: CO₂)</p>
<p>SCIENCE BIOGRAPHIES</p> <ul style="list-style-type: none"> Michael Faraday (chemist and physicist, developed the electric motor and electric generator) Elizabeth Garrett Anderson (English physician and feminist, first Englishwoman physician and surgeon) Florence Nightingale (pioneering woman nurse during the Crimean War who later established the Nightingale Training School for nurses at St Thomas' Hospital in London) Charles Drew (American doctor and medical researcher) Charles Darwin (English naturalist known for his theory of evolution called Natural Selection) 		<p>C. ELEMENTS</p> <ul style="list-style-type: none"> Elements have atoms of only one kind, having the same number of protons. There are a little more than 100 different elements. The periodic table: organises elements with common properties <ul style="list-style-type: none"> Atomic symbol and atomic number Some well-known elements and their symbols <ul style="list-style-type: none"> Hydrogen H Helium He Carbon C Nitrogen N Oxygen O Sodium Na Aluminium Al Silicon Si Chlorine Cl Iron Fe Copper Cu Silver Ag Gold Au Two important categories of elements: metals and non-metals <ul style="list-style-type: none"> Metals comprise about 2/3 of the known elements Properties of metals: most are shiny, ductile, malleable, conductive 	<p style="text-align: center;">Periodic Table Symbol Name Number Metals Non-metals Ductile Malleable Conductive Shiny</p>
		<p>C. CHEMICAL AND PHYSICAL CHANGE</p> <ul style="list-style-type: none"> Chemical change changes what a molecule is made up of and results in a new substance with a new molecular structure. Examples of chemical change: rusting of iron, burning of wood, milk turning sour Physical change changes only the properties or appearance of the substance, but does not change what the substance is made up of. Examples of physical change: cutting wood or paper, breaking glass, freezing water 	<p style="text-align: center;">Molecule, molecular</p>
		<p>CLASSIFYING LIVING THINGS</p> <p>Teachers: As the children study animal classifications, discuss: why do we classify? How does classification help us understand the natural world? Scientists have divided living things into five large groups called kingdoms, as follows:</p> <ul style="list-style-type: none"> Plant Animal Fungus (Mushrooms, yeast, mould, mildew) Protist (algae, protozoans, amoeba, euglena) Prokaryote (blue-green algae, bacteria) <p>Each Kingdom is divided into smaller groupings as follows:</p> <ul style="list-style-type: none"> Kingdom Phylum Class Order Family Genus Species Variety 	<p style="text-align: center;">Classification Classify Genus Species Variety Phylum Protist Fungus Prokaryote Homo sapien Taxonomist Biologist Vertebrate</p>

<p>When classifying living things, scientists use special names made up of Latin words (or words made to sound like Latin words), which help scientists around the world understand each other and ensure that they are using the same names for the same living things</p> <ul style="list-style-type: none"> • Homo Sapiens: the scientific name for the species to which human beings belong to (genus: Homo, species: Sapiens) • Taxonomists: biologists who specialise in classification • Different classes of vertebrates and major characteristics: fish, amphibians, reptiles, birds, mammals <p>CELLS: STRUCTURES AND PROCESSES</p> <p>All living things are made up of cells</p> <ul style="list-style-type: none"> • Structure of cells (both plant and animal) • Cell membrane: selectively allows substances in and out • Nucleus: surrounded by nuclear membrane, contains genetic material, divides for reproduction • Cytoplasm contains organelles, small structure that carry out the chemical activities of the cell, including mitochondria (which produce the cell's energy) and vacuoles (which store food, water, or wastes) • Plant cells, unlike animal cells, have cell walls and chloroplasts. • Cells without nuclei: monerans (bacteria) • Some organisms consist of only a single cell: for example, amoeba, protozoans, some algae. • Cells are shaped differently in order to perform different functions. • Organisation of cells into tissues, organs, and systems: <ul style="list-style-type: none"> ▪ In complex organisms, groups of cells form tissues (for example: in animals, skin tissue or muscle tissue; in plants, the skin of an onion or the bark of a tree). ▪ Tissues with similar functions form organs (for example: in some animals, the heart, stomach, or brain; in some plants, the root or flower). ▪ In complex organisms, organs work together in a system (recall, for example, from earlier studies of the human body, the digestive, circulatory, and respiratory systems) <p>TAXONOMIES</p> <p>Teachers: Introduce an example of how an animal is classified, in order for students to become familiar with the system of classification, not to memorise specific names. For example, a collie dog is classified as follows:</p> <ul style="list-style-type: none"> ▪ Kingdom: Animalia ▪ Phylum: Chordata (Subphylum: Vertebrata) ▪ Class: Mammalia (mammal) ▪ Order: Carnivora (eats meat) ▪ Family: Canidae (a group with doglike characteristics) ▪ Genus: Canis (a coyote, wolf, or dog) ▪ Species: Familiaris (a domestic dog) ▪ Variety: Collie (a breed of dog) 	<p>Cells Membrane Nucleus Reproduction Cytoplasm Organelles Mitochondria Vacuoles Nuclei Bacteria Amoeba Protozoan Algae Tissue Organs</p>
<p>SCIENCE BIOGRAPHIES</p> <ul style="list-style-type: none"> • Tim Burners-Lee (inventor of the World Wide Web) • Humphry Davy (chemist and inventor; discovered alkaline earth metals, chlorine and iodine) • Dorothy Hodgkin (British chemist, confirmed the structures of penicillin and vitamin B12) • Carl Linnaeus (botanist and 'Father of taxonomy' who standardised the classification system) 	

