

Science

Year 3	Vocab	Year 4	Vocab
<p>I. CYCLES IN NATURE</p> <p>A. SEASONAL CYCLES</p> <ul style="list-style-type: none"> • The four seasons and Earth’s orbit around the Sun [Review from Year 1] • Seasons and life processes <ul style="list-style-type: none"> ▪ Spring: sprouting, sap flow in plants, mating and hatching ▪ Summer: growth ▪ Fall: ripening, migration ▪ Winter: plant dormancy, animal hibernation <p>A. LIFE CYCLES</p> <ul style="list-style-type: none"> • The life cycle: birth, growth, reproduction, death • Reproduction in plants and animals <ul style="list-style-type: none"> ▪ From seed to seed with a plant ▪ From egg to egg with a chicken ▪ From frog to frog ▪ From butterfly to butterfly: metamorphosis (see below: insects) <p>B. THE WATER CYCLE</p> <ul style="list-style-type: none"> • Most of the Earth’s surface is covered by water • The water cycle <ul style="list-style-type: none"> ▪ Evaporation and condensation ▪ Water vapour in the air, humidity ▪ Clouds: cirrus, cumulus, stratus ▪ Precipitation, groundwater 	<p>Life Cycle Season Water Cycle Spring Sprouting Mating Hatching Summer Growth Autumn Migration Winter Hibernation Birth Growth Reproduction Seed Plant Egg Chicken Spawn Frog Solid Liquid Gas Water Ice Evaporation Condensation Rain Sleet Hail Snow Cloud</p>	<p>INTRODUCTION TO CLASSIFICATION OF ANIMALS</p> <ul style="list-style-type: none"> • Scientists classify animals according to the characteristics they share, for example: • Cold-blooded or warm-blooded Vertebrates (have backbones and internal skeletons) or invertebrates (do not have backbone or internal skeletons) • Different classes of vertebrates • Teachers: Children should become familiar with examples of animals in each class and some basic characteristics of each class, such as: • Fish: aquatic animals, breath through gills, cold-blooded, most have scales, most develop from eggs <ul style="list-style-type: none"> • that the female lays outside her body • Amphibians: live part of their life cycle in water and part on land, have gills when young, later <ul style="list-style-type: none"> • develop lungs, cold-blooded, usually have moist skin • Reptiles: hatch from eggs, cold-blooded, have dry, thick, scaly skin • Birds: warm-blooded, most can fly, have feathers and wings, most build nests, hatch from eggs, <ul style="list-style-type: none"> • most baby birds must be fed by parents and cared for until they can survive on their own (though some, like baby chickens and quail, can search for food a few hours after hatching) • Mammals: warm-blooded, have hair on their bodies, parents care for the young, females produce milk for their babies, breathe through lungs, most are terrestrial (live on land) though some are aquatic 	<p>Classify Classification Cold blooded Warm blooded Vertebrate Invertebrate Aquatic Gills Eggs Scales Amphibians Reptiles Mammals Terrestrial</p>
<p>II. INSECTS</p> <p>[Cross-curricular links with Year 3 Language and Literature: Poetry]</p> <ul style="list-style-type: none"> • Insects can be helpful and harmful to people. <ul style="list-style-type: none"> ▪ Helpful: pollination; products like honey, beeswax, and silk; eat harmful insects ▪ Harmful: destroy crops, trees, wooden buildings, clothes; carry disease; bite or sting • Distinguishing characteristics <ul style="list-style-type: none"> ▪ Exoskeleton, chitin ▪ Six legs and three body parts: head, thorax and abdomen ▪ Most but not all insects have wings • Life cycles: metamorphosis <ul style="list-style-type: none"> ▪ Some insects look like miniature adults when born from eggs, and they moult to grow (for example: grasshopper, cricket) ▪ Some insects go through distinct stages of egg, larva, pupa, adult (for example: butterflies, ants) • Social Insects <ul style="list-style-type: none"> ▪ Most insects live solitary lives, but some are social (for example: ants, honeybees, termites, wasps) ▪ Ants: colonies ▪ Honeybees: workers, drones, queen 	<p>Insect</p> <p>Fly, bee, wasp, sting, butterfly, ant, ladybird, beetle, mosquito, bite, pollination, honey, bees wax, silk, crops, abdomen, head, wings, six legs, egg, larva, pupae, adult, ant hill, colony, nest, beehive, worker, queen</p>	<p>II. ECOLOGY</p> <p>Teachers: Some topics here, such as habitats, were introduced in Year One. In this year, these topics will be covered in more detail and new areas will be studied.</p> <ul style="list-style-type: none"> • Habitats, interdependence of organisms and their environment • The concept of a ‘balance of nature’ (constantly changing, not a static condition) • The food chain: producers, consumers, decomposers • Ecosystems: how they can be affected by changes in environment (for example, rainfall, food supply, etc.) and by man-made changes • Fossils and how they can tell us about the environment long ago • Man-made threats to the environment <ul style="list-style-type: none"> • Air pollution: emissions, smog • Water pollution: industrial waste, run-off from farming • Measures we can take to protect the environment (for example, conservation, recycling) 	<p>Habitats Interdependence Environment Organism Food chain Producers Consumers Decomposers Prey Predator Eco System Pollution Emissions Recycling Conservation Smog</p>
<p>III. THE HUMAN BODY: CELLS, SYSTEMS AND HEALTH</p> <p>A. CELLS</p> <ul style="list-style-type: none"> • All living things are made up of cells, too small to be seen without a microscope. <ul style="list-style-type: none"> ▪ Cells make up tissues. ▪ Tissues make up organs. ▪ Organs work in systems. <p>A. THE DIGESTIVE SYSTEM</p> <p>Teachers: Explore with children what happens to the food we eat by studying body parts and functions involved in taking in food and getting rid of waste. Children should become familiar with the following:</p>	<p>Cell</p> <p>Digestive System Diet Teeth Blood cells Hair cells Building block Microscope Tissue Organ System Food Digestion Tongue Taste Sweet Salty</p>	<p>III. THE HUMAN BODY: SYSTEMS, VISION AND HEARING</p> <p>A. THE MUSCULAR SYSTEM</p> <ul style="list-style-type: none"> • Muscles • Involuntary and voluntary muscles <p>B. THE SKELETAL SYSTEM</p> <ul style="list-style-type: none"> • Skeleton, bones, marrow • Musculo-skeletal connection • Ligaments 	<p>Muscles Involuntary Voluntary</p> <p>Skeletal system Skeleton, bones, marrow, ligaments, tendons, Achilles tendon, cartilage, skull,</p>

<ul style="list-style-type: none"> Salivary glands, taste buds Teeth: incisors, canines, premolars and molars Oesophagus, stomach, liver, small intestine, large intestine <p>B. TAKING CARE OF YOUR BODY: A HEALTHY DIET</p> <ul style="list-style-type: none"> The 'food pyramid' Vitamins and minerals 	<p>Bitter Sour Saliva Gland Oesophagus Stomach Small intestine Large intestine Nutrients Dairy Protein Vitamin Mineral</p>	<ul style="list-style-type: none"> Tendons, Achilles tendon Cartilage Skull, cranium Spinal column, vertebrae Joints Ribs, rib cage, sternum Scapula (shoulder blades), pelvis, tibia, fibula Broken bones, X-rays 	<p>cranium, spinal column, vertebrae, ribs, rib cage sternum, scapula, pelvis, tibia, fibula, x-ray</p> <p>Brain Medulla Cerebellum Cerebrum Cerebral cortex Spinal cord, nerves, reflexes</p>
<p>IV. MAGNETISM</p> <p>Teachers: Magnetism was introduced in Year 1. Review and introduce new topics in Year 3, with greater emphasis on experimentation.</p> <ul style="list-style-type: none"> Magnetism demonstrates that there are forces we cannot see that act upon objects. Most magnets contain iron Lodestones: naturally occurring magnets Magnetic poles: north-seeking and south-seeking poles Magnetic field (strongest at the poles) Law of magnetic attraction: unlike poles attract, like poles repel. The Earth behaves as if it were a huge magnet: north and south magnetic poles (near, but not the same as, geographic North Pole and South Pole). Orienteering: use of a magnetised needle in a compass, which will always point to the north 	<p>Magnetism Simple Machines</p> <p>Attract Repel Bar Magnet Magnetic Field North South Pole Compass</p>	<p>C. THE NERVOUS SYSTEM</p> <ul style="list-style-type: none"> Brain: medulla, cerebellum, cerebrum, cerebral cortex Spinal cord Nerves Reflexes <p>D. VISION: HOW THE EYE WORKS</p> <ul style="list-style-type: none"> Parts of the eye: cornea, iris and pupil, lens, retina Optic nerve Farsighted and near-sighted <p>E. HEARING: HOW THE EAR WORKS</p> <ul style="list-style-type: none"> Sound as vibration Outer ear, ear canal Eardrum Three tiny bones (hammer, anvil and stirrup) pass vibrations to the cochlea Auditory nerve 	<p>Vision Cornea, Iris, Pupil, lens, retina, optic nerve, near sighted, Myopic, farsighted Hypermetropia</p> <p>Vibration Outer ear Ear canal Eardrum Hammer, anvil, stirrup, cochlea, auditory nerve</p>
<p>V. SIMPLE MACHINES</p> <p>Teachers: Examine with children how specific tools are made to perform specific jobs- for example, hammers, screwdrivers, pliers, etc. Through observation and experimentation, examine with children how simple machines help make work easier, and how they are applied and combined in familiar tools and machines.</p> <p>A. SIMPLE MACHINES</p> <ul style="list-style-type: none"> Lever Pulley Wheel and axle <ul style="list-style-type: none"> Gears: wheels with teeth and notches How gears work and familiar uses (for example, in bicycles) Inclined plane Wedge Screw <p>B. FRICTION, AND WAYS TO REDUCE FRICTION (LUBRICANTS, ROLLERS, ETC.)</p>	<p>Tool Hammer Screwdriver Plier Nail Level Wheel Gear Friction Pulley Inclined plane Wedge Screw</p>	<p>IV. LIGHT AND OPTICS</p> <p>Teachers: Through experimentation and observation, introduce children to some of the basic physical</p> <ul style="list-style-type: none"> phenomena of light, with associated vocabulary. The speed of light: light travels at an amazingly high speed. Light travels in straight lines (as can be demonstrated by forming shadows). Transparent and opaque objects Reflection Mirrors: plane, concave, convex Use of mirrors in telescopes and some microscopes The spectrum: use a prism to demonstrate that white light is made up of a spectrum of colours. Lenses can be used for magnifying and bending light (as in magnifying glass, microscope, camera, telescope, binoculars). 	<p>Light Optic Transparent Opaque Translucent Reflection Plane Concave Convex Telescope Microscope Prism Spectrum White light Lens Magnify Camera Binoculars</p>
<p>VI. SCIENCE BIOGRAPHIES</p> <ul style="list-style-type: none"> Archimedes (ancient Greek mathematician, physicist, engineer, inventor, and astronomer) [Cross-curricular link with History and Geography] Aristotle (Greek philosopher: wrote on physics, biology, logic, poetry, theatre, rhetoric, politics and ethics) Anton van Leeuwenhoek (invented the microscope) The Curie Family including Marie Curie (discovered radiation and two new elements) 		<p>V. SOUND</p> <p>Teachers: Through experimentation and observation, introduce children to some of the basic physical phenomena of sound, with associated vocabulary.</p> <ul style="list-style-type: none"> Sound is caused by an object vibrating rapidly. Sounds travel through solids, liquids and gases. Sound waves are much slower than light waves. Speed of sound: Concorde Qualities of sound Pitch: high or low, faster vibrations = higher pitch, slower vibrations = lower pitch Intensity: loudness and quietness Human voice Larynx (voice box) Vibrating vocal chords: longer, thicker vocal chords create lower, deeper voices Sound and how the human ear works Protecting your hearing 	<p>Vibrations Sound wave Pitch Loud Quiet Larynx</p>
<p>VI. ASTRONOMY</p>			<p>Big Bang</p>

	<ul style="list-style-type: none"> • The 'Big Bang' as one theory • The universe: an extent almost beyond imagining • Galaxies: Milky Way and Andromeda • Our solar system • Sun: source of energy (heat and light) • The nine planets: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune, Pluto [Note that, in 2006, Pluto was classified as a dwarf planet] • Planetary motion: orbit and rotation • How day and night on Earth are caused by the Earth's rotation • Sunrise in the east and sunset in the west • How the seasons are caused by the Earth's orbit around the sun, tilt of the Earth's axis • Gravity, gravitational pull • Gravitational pull of the moon (and to a lesser degree, the sun) causes ocean tides on Earth • Gravitational pull of 'black holes' prevents light from escaping • Asteroids, meteors ('shooting stars'), comets, Halley's Comet • How an eclipse happens • Stars and constellations • Orienteering (finding your way) by using North Star, Big Dipper • Exploration of space, Observation through telescopes • Rockets and satellites: from unmanned flights • Apollo 11, first landing on the moon: 'One small step for a man, one giant leap for mankind' • Space shuttle 	<p>Universe Galaxy Milky Way Andromeda Sun Planets Planet Names Orbit Rotation Season Earth axis Gravity Black holes Asteroid Meteor Comet Halley's Comet Eclipse Constellations Stars Orienteering North Star Plough Telescope Rocket Satellite Space Shuttle Apollo 11</p>
	<p>VII. SCIENCE BIOGRAPHIES</p> <ul style="list-style-type: none"> • Alexander Graham Bell (invented the telephone) • Copernicus (had new sun-centred idea about the solar system) • Galileo Galilei ('Father of modern science', provided scientific support for Copernicus's theory) • Caroline Herschel (German-British astronomer, discovered several comets, worked with brother William) • Isaac Newton (English physicist, mathematician, astronomer, natural philosopher and alchemist) 	