

AFNORTH International Elementary School

Science Curriculum

INTERNATIONAL SCIENCE CURRICULUM IY1-M2 2006/07

STRAND	IY1	IY2	IY3	IY4	IY5	IY6	M1	M2
Life Systems	Growing Things	Growing Plants	Characteristics and needs of living things	Growth and changes in animals	Growth and changes in plants	Habitats and communities	Ecosystems	Diversity of living things
Matter and Materials	Exploring materials using the 5 senses	Properties of Materials	Characteristics of objects and properties of materials	Properties of liquids and solids	Magnetic & Statically charged materials, circuits & conductors	Materials that transmit, reflect, absorb light, or sound	Properties of and changes in matter	Properties of air and characteristics of flight
Energy and Control	The environment	Pushes & Pulls	Movement and Energy in our lives	Energy in the environment	Forces and movement	Light and sound energy	Electricity	Conservation of Energy
Structures and Mechanisms Technology	How things work	Toys: Pushing & Pulling	Everyday structures	Movement	Stability	Pulleys & Gears	Forces in Action	Motion
Earth and Space Systems	Weather & Seasons	Light & Dark	Daily and Seasonal cycles	Air, water, rocks, and soil in the environment	The Earth & It's Materials	The Solar System	Weather	Space
P/S/HE	Safety & Rules	Ourselves Senses	Health & Growth	Healthy Eating	Moving & Growing	Staying Healthy	Reproduction Personal Safety & Group Safety	Body System & Reproduction

INTERNATIONAL SCIENCE CURRICULUM

YEAR GROUP **IY1**

STRAND	TOPIC TIME ALLOCATION	STANDARDS/OBJECTIVES/EXPECTATIONS The student needs to...	VOCABULARY
SCIENTIFIC INQUIRY	Conduct Investigations	A) Start to show an interest in why or how things happen. B) Start to understand how objects can be sorted according to simple criteria.	Why, How, What, Sort different, same change pattern
LIFE SYSTEMS	Growing Things	A) Identify characteristics of organisms. Organisms grow, change, and die. Growing plants life cycles. B) Find out about, and identify some features of living things.	Seed, shoot/sprout, root, grow, change
MATTER AND MATERIALS	Exploring materials using the Five Senses	A) Describe objects using characteristics, such as size, color, shape, smell, and texture. B) Explore how forces can move objects by pushing and pulling, fast and slow. C) Investigate objects and materials (using all appropriate senses).	Big, little, colors, shapes, touch, feel, smell, sight, hear, eyes, ears, skin, nose, small, medium, large, talk, thin, fat, wide, narrow
ENERGY AND CONTROL	The Environment	A) Understand the importance of recycling waste, litter, and sharing of resources.	Recycle, waste, litter, decomposition, environment
STRUCTURES AND MECHANISMS	How Things Work	A) Tools/Technology builds structures. How parents use technology at work. Look closely at similarities, differences, patterns, and how things work. Build and construct with a wide range of objects. Select tools and techniques. B) Understand everyday technology.	Similarities, differences, tools, build, construct, demolish, take apart, patterns
EARTH AND SPACE SYSTEMS	Weather & Seasons	A) Observe changes in the weather over time. B) Relate patterns in our daily activities to changes in the environment.	Summer, Spring, Fall, Winter, rainy, sunny, snowy, windy, hot, cold, tornado, puddles, hurricane, earthquake
P/S/HE	Safety & Rules	A) Discuss safety and rules	Classroom, playground, hallway, stairwell, safe, dangerous, respect, quiet, gentle, considerate

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STRAND	TOPIC TIME ALLOCATION	STANDARDS/OBJECTIVES/EXPECTATIONS The student needs to...	VOCABULARY
SCIENTIFIC INQUIRY	Conduct Investigations	A) Access information from a variety of reliable sources. B) Select and use appropriate tools to collect and record data, measure data, and make observations. C) Design and conduct observational investigations to solve a problem or answer a question. D) Ask questions about phenomena. E) Classify objects. F) Organize and explain data graphically. G) Interpret observations. H) Construct representative models of phenomena. I) Summarize and state conclusions of observations.	
LIFE SYSTEMS	Growing Plants	A) Know the characteristics of plants. Identify the leaf, roots, stem, and flower. B) Know the life cycle organisms. C) Identify the differences between living & non-living.	Plant, branch, flower, root, stem, leaf, weed, alive, and dead
MATTER AND MATERIALS	Properties of Materials	A) Name some common materials. B) Make observations of these and other common objects, and find test results.	Metal, plastic, wood, paper, glass, clay, rock, fabric, sand, soft, hard, smooth, shiny, rough, bendy, and strong
ENERGY AND CONTROL	Pushes & Pulls	A) Observe, describe, and compare movement of objects in terms of speed and direction. B) Describe how to make a familiar object start moving by pushing or pulling and recognize dangers to themselves in moving objects. C) Describe movements made by people & objects.	Twist, spin, swing, slide, swerve, hop, jump, turn, fast, slow, push, & pull
STRUCTURES AND MECHANISMS	Pushes & Pulls		Safe, danger, be careful, go faster, go slower, go further
EARTH AND SPACE SYSTEMS	Light & Dark Properties of Earth Materials	A) Compare characteristics of day and night. B) Name light sources and recognize they can see in the dark. C) Describe and compare some light sources and explain why it is dangerous to look at the sun. D) Identify the properties of Earth materials.	Night, day, light, dark, bright, black, reflect
P/S/HE	Personal Health & Safety Sound & Hearing	A) Identify and locate parts of their bodies, including sense organs. B) Observe and point out differences between humans and animals. C) Recognize the changes that take place, as animals get older. A) Recognize and describe many sounds. B) Describe how sounds are generated. C) Describe what they observe when they move further away from the source of sound. D) Chart these observations.	Eye, sight, see, ear, hearing, nose, smell, touch, feel, leg, arm, wing, and beak High, low, loud, soft, quiet, shake, pluck, rattle, ring, and silence

STRAND	TOPIC TIME ALLOCATION	STANDARDS/OBJECTIVES/EXPECTATIONS The student needs to....	VOCABULARY
SCIENTIFIC INQUIRY	Conduct Investigations	<ul style="list-style-type: none"> A) Access information from a variety of reliable sources. B) Design and conduct observational investigations to solve a problem or answer a question. C) Select and use appropriate tools to collect and record data, measure data, and make observations. D) Ask questions about phenomena, make predictions, and begin to use scientific vocabulary in reporting observations. E) Use classification systems. F) Organize and explain data graphically. G) Interpret data from observations and investigations. H) Construct representative models of phenomena. I) Describe objects, procedures, and results orally. J) Summarize and state conclusions of scientific investigations. 	
LIFE SYSTEMS	Characteristics & Needs of Living Things	<ul style="list-style-type: none"> A) Demonstrate an understanding of the basic needs of animals and plants (need for food, air, and water) and their local environment B) Investigate the characteristics and needs of animals and plants C) Demonstrate awareness that animals and plants depend on their environment to meet their basic needs D) Demonstrate an understanding that organisms have life cycles E) Describe the requirements for good health for humans. 	
MATTER AND MATERIALS	Properties of Objects & Materials Changing Materials	<ul style="list-style-type: none"> A) Distinguish between objects and materials B) Identify and describe the properties of some materials A) Investigate the properties of materials & how they can be changed. B) Describe the function of specific materials in manufactured objects that people use in daily life. 	Natural, man-made heated, cooled, squashing, bending, twisted, stretching
ENERGY AND CONTROL	Movement & Energy in our Lives	<ul style="list-style-type: none"> A) Demonstrate an understanding of ways in which energy is used in daily life. B) Investigate some common devices and systems that use energy and ways in which these can be controlled manually. C) Describe different used of energy and suggest ways in which energy can be conserved. D) Describe different types of movement (push & pull, start & stop) E) Understand simple circuits. 	Appliances, battery, buzzer, wire, bulb, components, switch, circuit, motor
STRUCTURES AND MECHANISMS	Design Everyday Structures	<ul style="list-style-type: none"> A) Demonstrate awareness that structures have distinctive characteristics. B) Design and make structures that meet a specific needs at home or at school. C) Demonstrate an understanding of the characteristics of different structures and of ways in which they are made. 	

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YEAR GROUP **IY3**

EARTH AND SPACE SYSTEMS	Daily & Seasonal Cycles	A) Demonstrate an understanding of changes that occur in daily and seasonal cycles and how these changes affect the characteristics, behavior, and location of living things. B) Investigate changes that occur in a daily cycle, and a seasonal cycle C) Describe how living things adapt to and prepare for daily and seasonal changes	
P/S/HE	Safety Population Changes Environment Health & Growth	A) Practice safety. B) Describe characteristics and change in population C) Identify types of resources D) Describe how environments change A) Describe the requirements for good health in humans.	

INTERNATIONAL SCIENCE CURRICULUM

YEAR GROUP

IY4

STRAND	TOPIC TIME ALLOCATION	STANDARDS/OBJECTIVES/EXPECTATIONS The student needs to...	VOCABULARY
SCIENTIFIC INQUIRY	Conduct Investigations	A) Access information from a variety of reliable sources. B) Design and conduct observational investigations. C) Select and use appropriate tools to collect and record data, measure data, and make observations. D) Ask questions about phenomena, make predictions, and begin to use scientific vocabulary in reporting observations. E) Use classification systems. F) Organize and explain data graphically. G) Interpret data from observations and investigations. H) Construct representative models of phenomena. I) Describe objects, procedures, and results orally and in writing. J) Summarize and state conclusions of scientific investigations.	Investigate, experiment, record, observe, question, discover, classify, organize, illustrate, review, summarize, chart, graph, label
LIFE SYSTEMS	Growth and Changes in Animals	A) Growth and Changes in Animals and Plants B) Demonstrate an understanding of the similarities and differences among various types of animals and the ways in which animals adapt C) Investigate physical and behavioral characteristics and the process of growth of different types of animals. D) Identify ways in which humans can affect other animals.	Animal, habitat, life cycle, classification, mammal, bird, reptile, amphibian, insect, arachnid, similarities, differences, characteristics, reproduction, prey, metamorphosis, conservation, extinction, germination, fertilization
MATTER AND MATERIALS	Properties of Liquids & Solids	A) Demonstrate an understanding of the properties of familiar liquids and solids. B) Investigate the properties of and interactions between liquids and solids and identify the types of objects or materials that can be used to contain liquids and solids. C) Identify and describe ways in which we use our knowledge of liquids and solids in making useful objects and in living in our environment.	Evaporation, water cycle, water vapour/gas, liquids, solids, combine, separate, reaction, mixture, solution, dissolving, crystal/crystallize
ENERGY AND CONTROL	Light, Electricity, & Magnetism Energy in the Environment	A) Explore characteristics of light and magnetism and electricity. A) Demonstrate and understanding of the movement of air and of water as sources of energy. B) Design and construct devices that are propelled by moving air and moving water. C) Identify wind and moving water as renewable sources of energy and determine the advantages and disadvantages of using them.	Wave, electricity, current, reflection, pole, attraction, energy, environment, conservation, renewable, natural, source,
STRUCTURES AND MECHANISMS	Forces & Movement	A) Describe the position and movement of objects and demonstrate an understanding of how simple mechanisms enable an object to move. B) Design and make simple mechanisms and investigate their characteristics. C) Recognize that different mechanisms and systems move in different ways. The different types of movement determine the design and the method of production of these mechanisms and systems.	Vehicle, lever, wedge, pulley, screw, wheel, ramp/inclined plane, push, pull, friction, force, energy, moving/movement, wind

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YEAR GROUP

IY4

EARTH AND SPACE SYSTEMS	Properties of Earth's Materials Rocks & Soil Air & Water	A) Demonstrate an awareness of the forms in which water and air are present in the environment and describe ways in which living things are affected by water and air. B) Investigate the visible effects of air and water in the environment. C) Describe ways in which clean air and water are vital for meeting the needs of humans and other living things. D) Describe characteristics of rock and soil and the changes that occur in the environment.	Issues, conservation, pollution, water management, erosion, effect, to affect, pollution, water management, weather/weathering, expand, contract, freezing, melting, thawing, glaciers, hard/hardness, soft/softness, texture, degree, elements
P/S/HE	Healthy Eating	A) Demonstrate an understanding of the Human Body Systems and how they work. B) Have an understanding of the importance of a healthy diet.	Nutrition/nutritious, balance, vitamins, portion, well-being, digestion, circulation

INTERNATIONAL SCIENCE CURRICULUM

YEAR GROUP **IY5**

STRAND	TOPIC TIME ALLOCATION	STANDARDS/OBJECTIVES/EXPECTATIONS The student needs to...	VOCABULARY
SCIENTIFIC INQUIRY	Conduct Investigations	A) Access information from a variety of reliable sources. B) Design and conduct observational and experimental investigations. C) Select and use appropriate tools to collect and record data, measure data, and make observations. D) Ask questions about phenomena, make predictions, and formulate explanations. E) Use classification systems. F) Use scientific vocabulary in reporting observations. G) Organize and explain data graphically. H) Analyze and interpret data from observations and investigations. I) Construct representative models of phenomena. J) Describe objects, procedures, and results orally and in writing. K) Summarize and state conclusions of scientific investigations.	Magic Question Procedure Material Safety Concerns Investigations Findings Graphic Organizer
LIFE SYSTEMS	Plants and their Habitats	A) Identify the similarities and differences in the physical characteristics of different plants. B) Investigate the changes in plants as they grow and the effects of different soils (e.g. sand, clay, peat) and humans on them. C) Understand life process of plants. (Reproduction, growth, death)	Food Chains, Food Webs, Reproduction, Growth, Life Cycles, Germination, Roots, Stamen, Pistil, Chlorophyll, Photosynthesis
MATTER AND MATERIALS	Magnetism & Electricity	A) Identify familiar uses of magnets and give examples of static electricity at home or school. B) Identify properties of materials that can be magnetized and how materials are affected by magnets or static electricity. C) Construct a simple circuit using switches and explain why some circuits' work and others don't. D) Investigate the effect of changing components on the brightness of bulbs.	Poles, Polarity, Positive, Negative, Voltage, Circuit, Insulation, Conductor, Charge, Static, Repel
ENERGY AND CONTROL	Forces & Friction	A) Demonstrate an understanding of how movement is caused by a force and investigate ways to change direction of movement. B) Describe the effects of friction or motion and infer the cause and effect of friction on the speed of an object. C) Build a model of a structure that can support and/or move a load, which demonstrates the properties of forces/friction at work. (Bridges, arches, cranes)	Gravity, Force, Friction, Energy

INTERNATIONAL SCIENCE CURRICULUM

YEAR GROUP **IY5**

<p>EARTH AND SPACE SYSTEMS</p>	<p>The Earth & It's Materials</p>	<p>A) Understand methods to classify rocks, minerals, & soils and demonstrate an understanding of similarities, & components of various rocks, minerals, & soils.</p> <p>B) Investigate and demonstrate an understanding of the dependence of living things on rocks, soils and minerals. (R, M, & S)</p> <p>C) Investigate the effects of moving H₂O on R, M, &S and identify a problem in the immediate environment and propose a solution.</p> <p>D) Describe the properties of the sun, moon, & stars.</p> <p>E) Observe & explain how the path of the sun across the sky changes during the year.</p>	<p>Eclipse, Position, Orbit, Fossil, Rotation, Soil, Minerals, Crystals, Erosion, Weathering, Geology, Paleontologist</p>
<p>P/S/HE</p>	<p>Life Process of Living Things</p>	<p>A) Compare shelters of animals and other living things.</p> <p>B) Describe observable characteristics of bones.</p> <p>C) Understand the life processes of living things and explain the changes that occur due to growth and nutrition (including the beginnings of reproduction)?</p>	<p>Characteristics, Nutrition, Reproduction, Skeleton</p>

INTERNATIONAL SCIENCE CURRICULUM

YEAR GROUP

IY6

STRAND	TOPIC TIME ALLOCATION	STANDARDS/OBJECTIVES/EXPECTATIONS	VOCABULARY
SCIENTIFIC INQUIRY	Conduct Investigations	The student needs to... A) Access information from a variety of reliable sources. B) Design and conduct observational and experimental investigations. C) Select and use appropriate tools to collect and record data, and measure data, and make observations. D) Ask questions about phenomena, make predictions, and formulate testable hypothesis. E) Use classification systems. F) Use scientific vocabulary in reporting observations. G) Organize and explain data graphically and use mathematics in scientific inquiry. H) Analyze, interpret, and evaluate data from observations and investigations. I) Construct representative models of phenomena. J) Describe objects, procedures, and results orally and in writing. K) Summarize and state conclusions of scientific investigations.	
LIFE SYSTEMS	Habitats & Communities	A) Demonstrate an understanding of the concepts of habitat and community, and identify that different plants and animals are found in different habitats. B) Investigate how animals and plants in two different habitats are suited to their environment. C) Describe ways in which humans and other living things and the environment need protection.	
MATTER AND MATERIALS	Materials that transmit, reflect, and absorb light	A) Demonstrate an understanding that certain materials can transmit, reflect, or absorb light. B) Investigate materials that transmit, reflect, or absorb light and use their findings in designing objects and choosing materials from which to construct them. C) Explain why materials that transmit, reflect, or absorb light are used in a variety of consumer products.	
ENERGY AND CONTROL	Sound Energy	A) Know that sounds are made when objects (e.g. strings on musical instruments) vibrate but that vibrations are not always directly visible. B) Know how to change the pitch & loudness of sounds produced by some vibrating objects. C) Identify that vibrations from sound sources require a medium (e.g. metal, wood, glass, air) through which to travel to the ear.	
STRUCTURES AND MECHANISMS	Pulleys & Gears	A) Demonstrate an understanding of the characteristics of pulleys and gears. B) Design and make pulley systems, and gear systems, and investigate how motion is transferred from one system to another. C) Identify ways in which different systems function, and identify appropriate criteria to be considered when designing and making such systems.	

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YEAR GROUP

M1

STRAND	TOPIC TIME ALLOCATION	STANDARDS/OBJECTIVES/EXPECTATIONS The student needs to....	VOCABULARY
SCIENTIFIC INQUIRY	Conduct Investigations	<ul style="list-style-type: none"> A) Access information from a variety of reliable sources. B) Design and conduct observational and experimental investigations. C) Select and use appropriate tools to collect and record data, measure data, and make observations. D) Ask questions about phenomena and formulate testable hypothesis. E) Use classification systems. F) Use scientific vocabulary in reporting observations. G) Organize and explain data graphically, using mathematics. H) Analyze, interpret, and evaluate data from observations and investigations. I) Construct representative models of phenomena. J) Describe objects, procedures, and results orally and in writing. K) Summarize and state conclusions of scientific investigations. 	
LIFE SYSTEMS	Ecosystems: Interdependence & Adaptation	<ul style="list-style-type: none"> A) Conclude that reproduction is essential to the continuation of all species. B) Compare the role of sperm and eggs in plants and animals. A) Conduct comparative investigations to conclude that plants reproduce in different ways. B) Differentiate between populations and ecosystems. C) Describe the roles of producers, consumers, and decomposers in an ecosystem. D) Illustrate a food web identifying the relationships between producers, consumers, and decomposers in an ecosystem. E) Describe ways that organisms adapt to their environments. F) Find examples of adaptation from the local environment. G) Use examples of adaptation from plants and animals to explain biological adaptation and the function of diversity in community survival. 	Ecosystem, populations, producers, consumers, decomposers, relationships, adaptation

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YEAR GROUP

M2

STRAND	TOPIC TIME ALLOCATION	STANDARDS/OBJECTIVES/EXPECTATIONS The student needs to...	VOCABULARY
SCIENTIFIC INQUIRY	Design, Conduct, & Communicate Scientific Investigations	A) Identify questions that can be answered through scientific investigations. B) Use appropriate tools, technology, and techniques to gather, analyze, and interpret data. C) Organize and maintain a journal showing procedures and results of investigations. D) Develop descriptions, explanations, predictions, and models using evidence. E) Use mathematics in scientific inquiry. F) Construct logical relationships between evidence and explanations. G) Recognize and analyze alternative explanations and predictions. H) Use fair testing procedures.	
LIFE SYSTEMS	Diversity of Living Things	A) Investigate classification systems and some of the processes of life common to all animals (e.g., growth, reproduction, movement, response, and adaptation) B) Describe ways in which classification systems can be used in everyday life. C) Demonstrate an understanding of ways in which classification systems are used to understand the diversity of living things and the interrelationships among living things.	Organisms, species, structure, kingdom, fossil
MATTER AND MATERIALS	Changes of Properties in Matter Acids & Alkalis Properties of Air & Flight	A) Demonstrate an understanding of simple chemical reactions. A) Demonstrate an understanding of PH and its application in daily life. (Batteries, cleaning, fluids) A) Demonstrate an understanding of the properties of air and other gases and explain how these can be applied to the principles of flight. B) Investigate the principles of flight and determine the effect of the properties of air on materials when designing and constructing flying devices. C) Identify design features of product or structures that make use of the properties of air, and give examples of technological innovations that have helped inventors to create or improve flying devices.	Base (alkali), acid, solid, liquid, gas, plasma, lift, thrust, streamline, aerodynamics, Bernoulli's Principle
ENERGY AND CONTROL	Electricity & Magnetism Energy Resources & Electrical Circuits Conservation of Energy	A) Demonstrate an understanding that electrical energy can be transformed into other forms of energy. B) Design and construct a variety of electrical circuits and investigate ways in which electrical energy is transformed into other forms of energy. C) Identify uses of electricity in the home and community and evaluate the impact of these uses on both our quality of life and the environment.	Current, battery, circuit, conductor, insulator, positive, negative, north pole, south pole

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YEAR GROUP

M2

STRUCTURES AND MECHANISMS	Motion	<p>A) Demonstrate an understanding of different kinds of motion (linear, rotational, reciprocating, & oscillating)</p> <p>B) Design and make mechanical devices, and investigate how mechanisms change one type of motion into another and transfer energy from one form to another.</p> <p>C) Identify modifications to improve the design and method of production of systems that have mechanisms that move in different ways.</p>	Fulcrum, rack & pinion, pivot, belt, rotational, linear, reciprocation, oscillating, motion
EARTH AND SPACE SYSTEMS	Earth, The Solar System, & Beyond (Space)	<p>A) Demonstrate an understanding of the patterns of change observable on earth as a result of the movement of the different bodies in the solar system (e.g., solar & lunar eclipses, tides, phases of the moon, positions of constellations) and of the physical characteristics of the different components of the solar system.</p> <p>B) Investigate, using models and simulations, the relationship between the sun, earth, and the moon, the patterns of change observable on earth that result from the movement of these bodies, and the physical characteristics of the different components of the solar system (e.g., the sun and the planets, inner planets and outer planets)</p> <p>C) Describe technological and scientific advances that enable humans to study space, and explain how these advances have affected the quality of life on earth.</p>	Constellations, planets, moons, comets, asteroids, solar maximum
P/S/HE	Human Organ System & Reproduction	<p>A) Demonstrate an understanding of the structure and function of respiratory, circulatory, digestive, excretion, and nervous system.</p> <p>B) Demonstrate an understanding of the interaction between organs within each system.</p>	