SCIENCE K-5 SCOPE AND SEQUENCE – WALLINGFORD PUBLIC SCHOOLS

Approved by Wallingford Board of Education June 13, 2007 - *Revisions Approved by Board of Education on February 25, 2008*

Grade	Skills: Inquiry, Numeracy and Literacy (Adopted by the Wallingford Board of Education January 24, 2005)	Properties of Matter (Adopted by the Wallingford Board of Education January 24, 2005)	Seasons (Adopted by the Wallingford Board of Education July 17, 2006)	Plants and Animals (Adopted by the Wallingford Board of Education July 17, 2006)
K	• Ask "how do you know?" and/ or "why" in appropriate situations. • Use five senses to describe an object. • Describe an object by comparing it to something else. • Sort by observable properties (heavy/light, sink/float, wet/dry, hot/cold, loud/quiet, flexibility, etc.). • Predict what might happen. • Design an investigation to help answer an investigable question. • Conduct simple investigations. • Demonstrate safe use of materials and simple equipment. • Record and communicate their observations using illustrations, words, graphs, etc.	• Select the appropriate senses to describe an object. • Identify different physical properties (heavy/light, sink/float, wet/dry, hot/cold, loud/quiet, flexibility, etc.) of materials. • Explain how objects are similar and/or different. • Explain how a push or a pull causes movement to an object. • Recognize that matter responds differently to change or energy.	• Name the four seasons. • Describe the characteristics of the four seasons. • Describe and record daily weather conditions and notice changes. • Relate seasonal weather patterns to appropriate choices of clothing and activities.	• Describe differences between themselves and others. • Describe how our bodies grow and change as we get older. • Discover that plants and animals are living things. • Recognize that plants and animals need air, water, and food to live. • Describe the similarities and differences in the appearance and behaviors of plants, birds, fish, insects and mammals (including humans). • Describe the similarities and differences in the appearance and behaviors of adults and their offspring.

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	Skills: **Inquiry, Numeracy and Literacy** (Adopted by the Wallingford Board of Education January 24, 2005)	**Senses** (Adopted by the Wallingford Board of Education July 17, 2006)**&** **Solids, Liquids, & Gases** (Adopted by the Wallingford Board of Education January 24, 2005)	**Weather** (Adopted by the Wallingford Board of Education February 25, 2008)	**New Plants** (Adopted by the Wallingford Board of Education February 25, 2008)

1	• Generate appropriate questions such as "why did…?" I wonder…?
	• Observe and describe commonalities and differences among objects.
	• Sort and classify objects based on two observable properties.
	• Predict what might happen
	• Design an investigation to help answer a testable question.
	• Conduct simple investigations.
	• Employ simple equipment and measuring tools, such as:
	  ◦ Equal arm balance
	  ◦ Thermometer
	  ◦ Scales
	  ◦ Electric hot plate
	  ◦ Rulers/Number lines/Yard Sticks
	  ◦ Non-standard measuring devices
	• Demonstrate safe use of materials.
		Senses
		• Identify the five senses – seeing, hearing, touching, tasting, and smelling.
		• Identify the parts of the body that are used by the five senses.
		• Understand that the use of each sense provides different information about an event or object.
		• Use each sense to provide appropriate details about an object or event.
		• Explain how adaptive tools extend the use of senses and aid people who need assistance (Braille, hand lenses, glasses, hearing aids, megaphone, prosthetics, etc.).
		• Sort and classify objects based on their observable properties.
		• Explore and describe variations of each sense (taste – bitter, sweet, salty, sour; touch - smooth, soft, rough, etc.; sound – loud,
			• Explain how the weather changes daily and seasonally.
			• Observe and collect weather data daily, weekly and monthly.
			• Analyze weather data for trends and patterns.
			• Measure weather using a thermometer, weather vane, anemometer and a rain gauge.
			• Describe how weather affects clothing, shelter and transportation.
				• Describe the structure and function of the main plant structures. (roots, stem, leaves, flower, bud and seed)
				• Investigate how the plant stems grow towards light and root systems grow towards water.
				• Explain that plants use sunlight to make their own food (photosynthesis).
				• Describe the properties of different leaves. (color, shape, texture, size, etc.)
				• Categorize plants in our daily life by their use. (food, decoration, medicine, herbs, and other uses)
				• Compare and contrast different seed properties. (color, shape, texture, size, etc.)
				• Investigate different environmental variables on seed germination and the growth of plants (amount of light, amount of water, temperature, etc.)

	• Organize appropriate and accurate measurements and observations using:
	  • Graphic organizers
	  • Picture and bar graphs
	  • Illustrations and diagrams
	  • Journaling
	• Draw conclusions based on data, observations and findings.
	• Communicate results or information in an appropriate manner using:
	  • Pictures
	  • Oral reports
	  • Journals
		soft, etc.; sight – optical illusions, magnifying glasses, prisms, etc.; smell – pleasant, unpleasant, etc.)
		
		Solids, Liquids and Gases
		• Compare and contrast states of matter.
		• Explain how matter can change through the application of energy (heat).
		• Classify objects in the environment according to their form of matter.
		• Recognize how scientists gain information about states of matter through observation.
				• Understand the role of the flower (plant life cycle) and how their structure (color, shape) is related to their function (attract pollinators).
				• Discover that new plants can be grown by planting seeds, bulbs, rooting and mature cuttings in water.
				• Compare change over time in different kinds of seeds and plants using a science notebook.
				• Describe characteristics that distinguish living form non-living things (growth, movement, reproduction and response to stimuli).
				• Explain that plants need carbon dioxide, water and sunlight to survive.

	Skills: **Inquiry, Numeracy and Literacy** (Adopted by the Wallingford Board of Education January 24, 2005)	**Balancing and Weighing** (Adopted by the Wallingford Board of Education February 25, 2008)	**Movement in Our Sky** (Adopted by the Wallingford Board of Education January 24, 2005)	**Organisms** (Adopted by the Wallingford Board of Education July 17, 2006)

2	• Generate testable questions and questions that need to be answered with print resources.
	• Observe and describe commonalities and differences among objects.
	• Sort and classify objects based on two or more observable properties.
	• Predict what might happen.
	• Design an investigation to help answer an investigable question.
	• Conduct simple investigations.
	• Employ simple equipment and measuring tools, such as:
	  ◦ Equal arm balance
	  ◦ Scales
	  ◦ Rulers/Number lines/Yard Sticks
	  ◦ Magnifying glasses
	  ◦ Non-standard measuring devises
	• Generate rules for safe use of materials and equipment.
	• Organize appropriate and accurate measurements and observations using:
	  ◦ Graphic organizers
		• Investigate and explain the concept of balance
		• Investigate variables that effect balance (mass of objects, location of fulcrum, relative lengths of the beam)
		• Explain how these variables effect balance: position of the fulcrum, mass, and arm length
		• Compare objects using an equal arm balance
		• Record comparisons using binary symbols greater than >, less than <, and equal to =
		• Demonstrate how to weigh an object by balancing that object against other objects
		• Demonstrate how to weigh objects against the non-standard (cubes) and standard units (gram weights)
		• K8. Recognize that the weight of an object is not determined solely by its size.
			• Identify the main components of our solar system (sun, planets, moons, etc.).
			• Compare and contrast the planets in our solar system (size, position from sun, general composition, and moons).
			• Explain the changes in appearance of our moon over time. (phases)
			• Describe the apparent movement of the sun.
			• Conclude that the Earth's movement is the reason for the apparent movement of the sun.
				• Describe different living and non-living things
				• Differentiate between living and non-living things(growth, movement, reproduction, and response to stimuli)
				• Investigate different environmental variables on the growth of plants (amount of light, amount of water, temperature, etc.)
				• Describe the different structures plants have for obtaining water (roots and stem) and sunlight (photosynthesis occurs in the leaves).
				• Observe and describe the life cycles of organisms that grow, but do not metamorphose (birds, fish, insects, mammals)
				• Observe/describe the changes in structure during the life cycles of organisms that metamorphose (frog, butterfly, etc.)
				• Discuss, draw, and write the ways that animals, including humans, move around (walk, fly, slither, swim, crawl, etc.)

	• Picture and bar graphs • Illustrations and diagrams • Journaling • Draw conclusions based on data, observations and findings. • Communicate results or information in an appropriate manner using: • Presentations • Visuals • Simple reports • Journals			• Compare and contrast the appearance and behaviors of adults and their offspring. • Compare and contrast the appearance and behaviors of plants, birds, fish, insects and mammals (including humans). • Identify different ways that animals, including humans, obtain water and food (hunting, farming, fishing, digging, shopping, carnivores/ herbivores/ omnivores, grazers, wild animals compared to domesticated, etc.)

	Skills: **Inquiry, Numeracy and Literacy** (Adopted by the Wallingford Board of Education January 24, 2005)	**Physics of Sound** (Adopted by the Wallingford Board of Education July 17, 2006)	**Water Cycle** (Adopted by the Wallingford Board of Education July 17, 2006)	**Plant Life Cycles & Soil Properties** (Based on Plant Growth and Development) (Adopted by the Wallingford Board of Education January 24, 2005)

3	• Generate testable questions and questions that need to be answered with print resources.
	• Observe objects and describe commonalities and differences among them.
	• Classify, based on observations of properties.
	• Predict what might happen.
	• Design an investigation to help answer an investigable question.
	• Conduct simple investigations.
	• Collect and record data utilizing simple equipment and measuring tools.
	• Organize results in an appropriate manner, using:
	  • Graphic organizers
	  • Charts and graphs.
	  • Illustrations or diagrams.
	  • Simple reports
	  • Draw conclusions based on data, charts, graphs, or observations.
	• Communicate results or information in an appropriate
		• Describe the factors that affect the pitch and loudness of sound produced by vibrating objects.
		  o Changing the length, width, tension, or thickness of an object affects the pitch of the sound when it vibrates.
		  o Changing the amount of vibration affects the loudness. More vibration (more energy) is louder.
		• Produce sounds with different pitches and volume levels.
		• Describe how sound is transmitted, reflected and/or absorbed by different materials.
		  o Some materials absorb sound and some materials reflect sound. Smaller, softer, more irregular materials absorb sound better. Harder, more regular, and larger objects reflect sound better.
		  o Sound can be reflected and heard as an echo.
		  o Sound travels differently through solids, liquids and gases. (fastest in
			• Identify the stages in the water cycle (evaporation and transpiration, condensation and precipitation, surface water and ground water, ice sheets and glaciers).
			• Explain the relationship between evaporation and condensation within the water cycle.
			• Describe that melting and evaporation require the addition of heat energy to the water and condensations and freezing require removal of heat energy from the water.
			• Recognize that water can be found many places on earth. (plants, animals, humans, soil, oceans, lakes, rivers, glaciers, air, etc.)
			• Explain the function and purpose of weather tools such as a thermometer, barometer, wind vane, and rain gauge.
			• Recognize that different cloud types are determined by weather conditions.
			• Identify different forms of precipitation.
				• Summarize the conditions necessary for plant growth.
				• Identify the distinct stages in the life cycle of a flowering plant from the germination of a seed to the production of new seeds.
				• Conclude that flowering plants must be pollinated in order to produce new seeds.
				• Recognize the interdependence between the pollinator and the plant.
				• Explain why it is advantageous for a plant to produce more than one seed.
				• Identify the properties of different types of soil.
				• Recognize how soil supports the growth of many plants.
				• Relate the properties of different soil types to their ability to retain water.

	manner, using: • Presentations • Visuals • Simple reports	solids and slowest in air). • Demonstrate how sound is affected by different materials (air, water, foam etc.) in different environments. (large room, small room, room with dome etc.) • Describe the structure and function of the human ear. • Explain how humans perceive sound including how the ear functions and how the nervous system sends messages to the brain. • Explore decibel levels of common sounds and explain reasons why sounds are different decibel levels. • Explore technological applications related to sound. (hearing aids, microphones, speakers, megaphones)		

	Skills: **Inquiry, Numeracy and Literacy** (Adopted by the Wallingford Board of Education January 24, 2005)	**Electric Circuits & Magnets** (Adopted by the Wallingford Board of Education July 17, 2006)	**Land & Water** (Adopted by the Wallingford Board of Education July 17, 2006) **Rocks & Minerals** (Adopted by the Wallingford Board of Education January 24, 2005)	**Food Webs & Adaptations** (Adopted by the Wallingford Board of Education February 25, 2008)

4	• Generate testable questions that need to be answered with print resources.
	• Identify testable questions.
	• Observe objects and describe commonalities and differences.
	• Classify, based on observations of properties.
	• Predict what might happen.
	• Design an investigation to help answer an investigable question.
	• Conduct simple investigations.
	• Employ simple equipment and measuring tools.
	• Organize appropriate and accurate measurements and observations, using:
	  • Graphic organizers
	  • Charts and graphs
	  • Illustrations or diagrams
	  • Journaling
	• Draw conclusions based on data, charts, graphs or observations.
	• Communicate results or information in an appropriate
		• Describe how batteries and wires can transfer energy to light (a light bulb) and/or heat.
		• Explain the path of electricity in a circuit (open, closed, parallel, series circuit)
		• Wire a simple electrical circuit to light a light bulb.
		• Construct a circuit in more than one way using the same materials.
		• Use symbols to represent the different parts of an electric circuit schematic.
		• Classify materials as conductors of electricity and others materials as insulators based on tests using simple electrical circuits.
		• Explain how electricity is essential to our modern world.
		• Apply troubleshooting strategies (knowledge of electrical circuits) to complete an incomplete circuit.
		• Investigate the properties of magnets including:
		o Magnets have north and
			Land and Water
			• Describe how the sun's energy impacts the water cycle.
			• Identify different properties used to describe earth materials (soil, gravel, etc.).
			• Describe the role of water in erosion and river formation.
			• Describe the physical changes that occur in rocks and minerals as a result of weathering and erosion.
			• Investigate the effect of water on erosion and deposition with different water flows and slopes (stream tables).
			• Explain how the slope and flow affect erosion and deposition.
			• Identify the relationship between pore space (porosity) and water run off and their impact on earth materials.
			• Understand how humans (landscape, dams, houses, grass, etc.) and nature (force and frequency of river flow) may impact the direction and flow of rivers.
				• Describe how animals depend on other organisms (plants and animals) to provide the food and energy they need in order to grow and survive.
				• Understand the relationships in a food chain or web.
				• Describe how natural phenomena may cause changes to habitats and their inhabitants.
				• Describe how humans may cause changes to habitats and their inhabitants.
				• Describe how structural adaptations (e.g., camouflage, shape, body covering) and behavioral adaptations (e.g. hibernation, migration, etc.) help animals and plants survive in their environment.
				o Obtain air, water, food and protection
				o Land habitats
				o Water habitats
				
				Non-fiction titles have been purchased for each 4th grade teacher to teach the above objectives in a Reader's

	manner, using: • Presentations • Visuals • Simple reports **CSDE Embedded Tasks:** • **Soggy Paper** • **Go With the Flow** (part of Electrical Circuits)	south poles o Magnetic fields weaken as distance increases. o Magnets produce a force that some things respond to and some things do not. o Magnets exert a force at a distance/they can push or pull without touching. o A magnetic force can hold a limited amount of weight. o Magnets possess various degrees of strength. o Magnets can exert a force through materials.	**Rocks and Minerals** • Differentiate between rocks and minerals. • Classify rocks and minerals by their properties. • Relate the physical properties of rocks to their potential uses. • Identify the environmental conditions during the formation of sedimentary, igneous, and metamorphic rocks. • Relate the properties of rocks to the possible environmental conditions during their formation.	*Workshop non-fiction format. A unit overview and unit planner can be found on the W drive under W:\Language Arts\Reading\Grade 4\Food Web and Adaptations Non-fiction Unit. This unit was developed to integrate reading objectives & science objectives .*

	Skills: **Inquiry, Numeracy and Literacy** (Adopted by the Wallingford Board of Education January 24, 2005)	**Energize Me** (Based on Motion and Design) (Adopted by the Wallingford Board of Education January 24, 2005)	**Sun, Moon, and Earth** (Adopted by the Wallingford Board of Education July 17, 2006)	**Light Energy & Healthy Body** (Adopted by the Wallingford Board of Education June 13, 2007)

5	• Generate testable questions that need to be answered with print resources.
	• Observe objects and describe commonalities and differences among them.
	• Classify in a variety of ways based on properties.
	• Predict what might happen.
	• Design a fair test to answer an investigable question.
	• Revise plan based on observation/ results.
	• Conduct simple investigations.
	• Collect and record data using appropriate tools, such as:
	  • Metric ruler
	  • Timer
	  • Scales
	  • Non-standard measuring devices
	• Organize appropriate and accurate measurements and observations, using:
	  • Graphic organizers
	  • Charts and graphs
	  • Illustrations or diagrams
	  • Journaling
	• Draw conclusions based on data, charts, graphs, or
		• Conclude that push and pull are the basic forces that influence motion.
		• Recognize that work is moving an object a certain distance.
		• Analyze the effect of force on objects with different mass.
		• Demonstrate some forces that resist motion, like friction, gravity, and air resistance.
		• Identify forms of energy, such as electrical, nuclear, sound, heat, light, chemical, mechanical, and magnetic.
		• Explain that energy can be transformed (changed).
		• Explain that energy can be transferred (moved).
		• Evaluate the advantages and disadvantages of sources of energy, such as fossil fuels, solar, hydroelectric, wind, and nuclear.
			• Analyze relationships between the sun and earth, the earth and moon and the sun, earth and moon.
			• Distinguish the difference between revolution and rotation.
			• Illustrate the four seasons
			• Explain the changes in appearance of our moon over time
			• Describe the apparent movement of the sun.
			• Conclude that the earth's movement is the reason for the apparent movement of the sun.
			• Conclude that the earth's axis is responsible for our seasons.
			• Conclude that the rotation of the earth is responsible for the cycle of day and night.
				Light Energy:
				• Identify different sources of light.
				• Determine the path the light takes from a given light source.
				• Illustrate the path the light takes after hitting a mirror. (Reflect)
				• Explain what happens to the path of light as it goes through a lens.(Refract / bent)
				• Discuss the difference between reflection and refraction.
				• Identify what different surfaces can absorb light and reflect light.
				  • Translucent
				  • Transparent
				  • Opaque
				• Demonstrate how white light is a combination of all colors of light.
				• Illustrate how white light can be separated into colors.
				• Describe how we see different colors in our environments.
				  • Absorption
				  • Reflection
				• Identify the five main parts of

	observations.
	• Communicate results or information in an appropriate manner, using:
	  • Presentations
	  • Visuals
	  • Simple reports
				the eye. (lens, cornea, iris, pupil, retina)
				• Explain the function of each part of the eye.
				• Relate the parts of the camera to the parts of the eye.
				• Describe the uses of different instruments that enhance our vision such as eyeglasses, magnifiers, periscopes and telescopes.
				• Investigate factors affecting human reaction time (Catch it! Inquiry Investigation)
				
				CSDE Embedded Tasks:
				• **Catch it!** (Part of Light Kit)
				
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				*Note: **The following objectives related to "Healthy Body" are not assessed on the 5th grade Science CMT.** Non-fiction titles have been purchased for each 5th grade teacher to teach the following objectives in a Reader's Workshop non-fiction format. A unit overview and unit planner can be found on the W drive under W:\Language Arts\Reading\Grade 5\Healthy Body Non Fiction. This unit was developed to integrate reading objectives, science objectives and health objectives for 5th grade.*

				Healthy Body: • Describe the basic structures and functions of the human body systems (such as the skeletal, muscular, nervous, respiratory, digestive and circulatory). • Recognize healthy choices and habits related to the human body systems. • Recognize how family history and other risk factors are related to cause and prevention of disease and other health problems.