Effective Date: 2008-2009

Hamburg Area School District

Name of Course: Grade 4 Science
Department: Science

Grade Level: 4
Instructional Time: 150 min. per cycle
Length of Course: 3 quarters
Period Per Cycle: 5 periods
Length of Period: 30 minutes

Texts and Resources: Harcourt Science Textbook (4th grade), educational videos (examples are: Mr. Wizard, Magic School Bus, United Streaming), Star Lab, and investigation kits that come with the Harcourt series

Assessments: Tests the Harcourt series provides, teacher made quizzes, and quarterly projects.

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Course Name: Grade 4 Science
Unit: Weather **Time Line:**

Essential Content/ Essential Questions	Performance Objectives	Standards/Anchors
What are the basic cloud types?	Identify basic cloud types: cirrus, cumulus, stratus, and cumulonimbus	S4.D.2.1.1
What are the instruments used to study weather and what do they measure?	Identify thermometer, rain gauge, weather vane, anemometer, and barometer Tell what each instrument measures	S4.D.2.1.3 S4.D.2.1.3
What weather is associated with the different cloud types?	Make connections to basic elements of weather Identify weather associated with various cloud types Identify and describe observable weather indicators Predict future conditions	S4.D.2.1.1 S4.D.2.1.2 S4.A.2.1.3 S4.A.3.3.1
What is the water cycle?	Explain how water goes through phase changes	S4.D.1.3.2

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Course Name: Grade 4 Science
Unit: Matter **Time Line:**

Essential Content/ Essential Questions	Performance Objectives	Standards/Anchors
What are the three states of matter?	Describe observable physical properties of matter Identify and categorize substances as a solid, liquid, or gas	S4.C.1.1.1 S4.C.1.1.2
What are the instruments used to measure the mass and volume of a substance?	Identify and use appropriate measuring tools and tell the information they provide eg., balance-mass, graduated cylinder-volume	S4.A.2.2.1
How is the density of cold and hot water different?	Generate questions about the difference of the density of hot and cold water that can be answered through scientific investigation State a conclusion that is consistent with the data	S4.A.2.1.1 S4.A.2.1.4

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Course Name: Grade 4 Science
Unit: Forces and Motion **Time Line:**

Essential Content/ Essential Questions	Performance Objectives	Standards/Anchors
What is motion?	Describe the position of an object by locating it relative to another object(i.e., frame of reference) Calculate speed of an object.	S4.C.3.1.3
What effects do forces have on objects?	Describe changes in motion caused by forces Compare the relative movement of objects or describe types of motion that are evident	S4.C.3.1.1 S4.C.3.1.2
What is friction?	Describe changes in motion caused by friction?	S4.C.3.1.1

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Course Name: Grade 4 Science
Unit: Earth-Sun-Moon **Time Line:**

Essential Content/ Essential Questions	Performance Objectives	Standards/Anchors
How do the Earth and Sun move in relationship to each other?	Describe the motions of the Sun-Earth-Moon system	S4.D.3.1.1
How do the Earth and moon move in relationship to each other?	Describe the motions of the Sun-Earth-Moon system	S4.D.3.1.1
What causes day and night?	Explain how the motion of the Sun-Earth-Moon system relates to time	S4.D.3.1.2
What causes seasonal changes?	Describe the causes of seasonal change as they relate to the revolution of Earth and the tilt of Earth's axis	S4.D.3.1.3

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Course Name: Grade 4 Science
Unit: Animal Growth and Adaptations **Time Line:**

Essential Content/ Essential Questions	Performance Objectives	Standards/Anchors
What are the basic needs of animals?	Describe basic needs of plants and animals (e.g., air, water, food).	**S4.B.1.1.3**
	Identify characteristics for plant and animal survival in different environments (e.g., wetland, tundra, desert, prairie, deep ocean, forest).	**S4.B.2.1.1**
	Describe what happens to a living thing when its habitat is changed.	**S4.B.3.2.1**
	Describe interactions between living and nonliving components (e.g. plants – water, soil, sunlight, carbon dioxide, temperature; animals – food, water, shelter, oxygen, temperature) of a local ecosystem.	**S4.B.3.1.2**
	Describe the living and nonliving components of a local ecosystem (e.g., lentic and lotic systems, forest, cornfield, grasslands, city park, playground).	**S4.B.3.1.1**
	Identify life processes of living things (e.g., growth, digestion, respiration),	**S4.B.1.1.1**

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Course Name: Grade 4 Science
Unit: Animal Growth and Adaptations **Time Line:**

Essential Content/ Essential Questions	Performance Objectives	Standards/Anchors
What are the basic needs of animals? (Continued)	Identify biological pests (e.g., fungi – molds, plants – foxtail, purple loosestrife, Eurasian water milfoil; animals – aphides, ticks, zebra mussels, starlings, mice) that compete with humans for resources. Describe the human dependence on the food and fiber systems from production to consumption (e.g., food, clothing, shelter, products).	**S4.B.3.3.3** **S4.B.3.3.2**
How do animals' body parts help them meet their needs?	Compare similar functions of external characteristics of organisms (e.g., anatomical characteristics: appendages, type of covering, body segments).	**S4.B.1.1.2**
How do animals' behaviors help them meet their needs?	Explain how specific adaptations can help a living organism survive (e.g., protective coloration, mimicry, leaf sizes and shapes, ability to catch or retain water). Explain and predict how changes in seasons affect plants, animals, or daily human life (e.g., food availability, shelter, mobility).	**S4.B.2.1.2** **S4.B.3.2.3**

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Course Name: Grade 4 Science
Unit: Plant Growth and Adaptations **Time Line:**

Essential Content/ Essential Questions	Performance Objectives	Standards/Anchors
What do plants need to live?	Categorize the parts of an ecosystem as either living or nonliving and describe their roles in the system	**S4.A.3.1.3**
	Explain a relationship between the living and nonliving components in a system (e.g., food web, terrarium).	**S4.A.3.1.2**
	Identify the parts of the food and fiber systems as they relate to agricultural products from the source to the consumer.	**S4.A.3.1.4**
	Identify and describe observable patterns (e.g., growth patterns in plants, weather, water cycle).	**S4.A.3.3.1**
	Describe basic needs of plants and animals (e.g., air, water, food	**S4.B.1.1.3**
	Identify characteristics for plant and animal survival in different environments (e.g., wetland, tundra, desert, prairie, deep ocean, forest).	**S4.B.2.1.1**
	Describe interactions between living and nonliving components (e.g. plants – water, soil, sunlight, carbon dioxide, temperature; animals – food, water, shelter, oxygen, temperature) of a local ecosystem.	**S4.B.3.1.2**

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Course Name: Grade 4 Science
Unit: Plant Growth and Adaptations **Time Line:**

Essential Content/ Essential Questions	Performance Objectives	Standards/Anchors
What do plants need to live? (Continued)	Describe the living and nonliving components of a local ecosystem (e.g., lentic and lotic systems, forest, cornfield, grasslands, city park, playground).	**S4.B.3.1.1**
	Describe what happens to a living thing when its habitat is changed.	**S4.B.3.2.1**
	Describe and predict how changes in the environment (e.g., fire, pollution, flood, building dams) can affect systems.	**S4.B.3.2.2**
	Explain and predict how changes in seasons affect plants, animals, or daily human life (e.g., food availability, shelter, mobility).	**S4.B.3.2.3**
	Describe the effects of pollution (e.g., litter) in the community	**S4.B.3.3.5**
How do leaves, stems, and roots help plants live?	Identify and describe observable patterns (e.g., growth patterns in plants, weather, water cycle).	**S4.A.3.3.1**
	Describe how different parts of a living thing work together to provide what the organism needs (e.g., parts of plants: roots, stems, leaves).	**S4.B.1.1.4**
	Explain how specific adaptations can help a living organism survive (e.g., protective coloration, mimicry, leaf sizes and shapes, ability to catch or retain water).	**S4.B.2.1.2**

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Course Name: Grade 4 Science
Unit: Plant Growth and Adaptations **Time Line:**

Essential Content/ Essential Questions	Performance Objectives	Standards/Anchors
How do plants reproduce?	Generate questions about objects, organisms, or events that can be answered through scientific investigations.	**S4.A.2.1.1**
	Identify and describe observable patterns (e.g., growth patterns in plants, weather, water cycle).	**S4.A.3.3.1**
	Describe the life cycles of different organisms (e.g., moth, grasshopper, frog, seed-producing plant).	**S4.B.1.1.5**
	Identify physical characteristics (e.g., height, hair color, eye color, attached earlobes, ability to roll tongue) that appear in both parents and could be passed on to offspring.	**S4.B.2.2.1**

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Course Name: Grade 4 Science
Unit: Heat-Energy on the Move **Time Line:**

Essential Content/ Essential Questions	Performance Objectives	Standards/Anchors
How does heat affect matter?	Recognize basic energy types and sources, or describe how energy can be changed from one form to another. Use physical properties [e.g., mass, shape, size, volume, color, texture, magnetism, state (i.e., solid, liquid, and gas), conductivity (i.e., electrical and heat)] to describe matter	**S4.C.2.1** **S4.C.1.1.1**
How can thermal energy be transferred?	Identify energy forms, energy transfer, and energy examples (e.g., light, heat, electrical).	**S4.C.2.1.1**
How is thermal energy produced and used?	Describe the flow of energy through an object or system (e.g., feeling radiant heat from a light bulb, eating food to get energy, using a battery to light a bulb or run a fan).	**S4.C.2.1.2**

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Course Name: Grade 4 Science
Unit: Electricity and Magnetism **Time Line:**

Essential Content/ Essential Questions	Performance Objectives	Standards/Anchors
What is static electricity?	Use physical properties [e.g., mass, shape, size, volume, color, texture, magnetism, state (i.e., solid, liquid, and gas), conductivity (i.e., electrical and heat)] to describe matter	**S4.C.1.1.1**
What is an electric charge?	Recognize or illustrate simple direct current series and parallel circuits composed of batteries, light bulbs (or other common loads), wire, and on/off switches. Use physical properties [e.g., mass, shape, size, volume, color, texture, magnetism, state (i.e., solid, liquid, and gas), conductivity (i.e., electrical and heat)] to describe matter	**S4.C.2.1.3** **S4.C.1.1.1**
What is a magnet?	Describe changes in motion caused by forces (e.g., magnetic, pushes or pulls, gravity, friction).	**S4.C.3.1.1**
What is an electromagnet?	Recognize or illustrate simple direct current series and parallel circuits composed of batteries, light bulbs (or other common loads), wire, and on/off switches. Use physical properties [e.g., mass, shape, size, volume, color, texture, magnetism, state (i.e., solid, liquid, and gas), conductivity (i.e., electrical and heat)] to describe matter	**S4.C.2.1.3** **S4.C.1.1.1**