FOURTH GRADE
CONTENT STRANDS:
Inquiry Life Science
Physical Science Earth and Space Science
COMPETENCIES AND OBJECTIVES:
INQUIRY
1. Explain and use skills necessary to conduct scientific inquiry.
a. Form hypotheses and predict outcomes of problems to be investigated. (DOK 3)
b. Use the senses and simple tools to gather qualitative information about objects or events (size, shape, color, texture, sound, position, change). (DOK 1)
c. Demonstrate the accurate use of simple tools to gather and compare information
(DOK 1)
• Tools (English rulers [to the nearest eighth of an inch], metric rulers [to the nearest centimeter], thermometers, scales, hand lenses, microscopes, balances, clocks, calculators, anemometers, rain gauges)
• Types of data (height, mass/weight, temperature, length, distance, volume, area, perimeter)
d. Use simple sketches, diagrams, tables, charts, and writing to draw conclusions and communicate data results. (DOK 2)
e. Interpret and describe patterns of data using drawings, diagrams, charts, tables, graphs, and maps. (DOK 2)
f. Explain why scientists and engineers often work in teams with different individuals doing different things that contribute to the results. (DOK 2)
g. Draw conclusions about important steps (e.g., making observations, asking questions, trying to solve a problem, etc.) that led to inventions and discoveries.
(DOK 3)

PHYSICAL SCIENCE
2. Use the properties of objects and materials, position and motion of objects, and transfer of energy to develop an understanding of physical science concepts.
a. Recognize that materials may be composed of parts that are too small to be seen without magnification. (DOK 1)
b. Distinguish between physical and chemical changes and between objects composed of a single substance from those composed of more than one substance. (DOK 2)
c. Determine the causes and effects of forces on motion. (DOK 2)
• Force exerted over a distance causes work to be done and that the result (work) is the product of force and distance
• Friction on moving objects and actions that increase or decrease friction
• Momentum and inertia
d. Explain how energy flowing through an electrical circuit can be converted from electrical energy to light, sound, or heat energy. (DOK1)
• Parts of an electric circuit and resulting actions when circuits are opened or closed
• Construction and uses of electromagnets
• Energy transferred through an electrical circuit to a bulb or bell to its surroundings as light, sound, and heat (thermal) energy
e. Describe how light behaves (travels in a straight line, is absorbed, reflected, refracted, or appears transparent or translucent). (DOK 1)
f. Investigate and draw conclusions about the relationship between the rate of vibrating objects and the pitch of the sound. (DOK 3)
g. Describe how heat flows from a warm object to a cold one and categorize examples of materials that may or may not be used as insulators. (DOK 2)

LIFE SCIENCE

3. Analyze the characteristics, structures, life cycles, and environments of organisms.

a. Describe the cause and effect relationships that explain the diversity and evolution of organisms over time. (DOK 2)

• Observable traits due to inherited or environmental adaptations
• Variations in environment (over time and from place to place)
• Variations in species as exemplified by fossils
• Extinction of a species due to insufficient adaptive capability in the face of environmental changes

b. Classify the organs and functions of the nervous, circulatory, and respiratory systems of the body. (DOK 1)

c. Compare characteristics of organisms, including growth and development, reproduction, acquisition and use of energy, and response to the environment. (DOK 2)

• Life cycles of various animals to include complete and incomplete metamorphosis
• Plant or animal structures that serve different functions in growth, adaptation, and survival
• Photosynthesis

d. Distinguish the parts of plants as they relate to sexual reproduction and explain the effects of various actions on the pollination process (e.g., wind, water, insects, adaptations of flowering plants, negative impacts of pesticides). (DOK 2)

e. Analyze food webs to interpret how energy flows from the sun. (DOK 2)

f. Describe the structural and functional relationships among the cells of an organism. (DOK 2)

• Benefit from cooperating
• Vary greatly in appearance
• Perform very different roles

EARTH AND SPACE SCIENCE

4. Develop an understanding of the properties of Earth materials, objects in the sky, and changes in Earth and sky.

a. Classify sedimentary, metamorphic, and igneous rocks. (DOK 2)

b. Compare and contrast Earth's geological features and the changes caused by external forces. (DOK 2)

• Bodies of water, beaches, ocean ridges, continental shelves, plateaus, faults, canyons, sand dunes, and ice caps
• External forces including heat, wind, and water
• Movement of continental plates

c. Investigate, record, analyze and predict weather by observing, measuring with

simple weather instruments (thermometer, anemometer, wind vane, rain gauge, barometer and hygrometer), recording weather data (temperature, precipitation, sky conditions, and weather events), and using past patterns to predict future patterns. (DOK 2)
d. Describe how human activities have decreased the capacity of the environment to support some life forms. (DOK 2)
• Reducing the amount of forest cover
• Increasing the amount of chemicals released into the atmosphere
• Farming intensively
e. Compare and contrast the seasons and explain why seasons vary at different locations on Earth. (DOK 2)
f. Describe objects in the universe including their movement. (DOK 2)
• Physical features of the moon (craters, plains, mountains)
• Appearance and movement of Earth and its moon (e.g., waxing/waning of the moon and lunar/solar eclipses)
• Why a planet can be seen in different constellations (locations) at different times
g. Summarize the process that results in deposits of fossil fuels and conclude why fossil fuels are classified as nonrenewable resources. (DOK 2)

Lowndes County Science Pacing Guide

MS Frameworks Pacing Guide Worksheet for Science **Grade Level: 4th**
Grading Period: 1st – 9 Wks

Chapter/Unit	Lesson Topic	Objective Number	Approximate Days Needed	Suggested Teaching Strategies
*Scientific Method	Student pages x-xxiv Reference RI-R6	Inquiry: **1. Explain and use skills necessary to conduct scientific inquiry. (DOK3)** 1.a-g (see framework)	10-15 days (flexible)	• Unit on Scientific method • Use resource book EARTHSCIENCE FOR EVERY KID. Book of experiments. • Incorporate writing prompts using 5 senses
Unit A-1 Lesson 1	What are cells and what do they do?	**3. Analyze the characteristics, structures, life cycles, and environments of organisms.** **3.f**. Describe the structural	5 days	●Using a microscope, have students view cells from different tissues and organs of the human body. ● Have students draw and label the cells.(DOK 1)

		and functional relationships among the cells of an organism. (DOK 2)		●Using a Venn diagram, compare the plant and animal cell. (DOK 2) • Promethean board slide show of cell structure or computer research
Unit A-1 Lesson 2	What are Animals? (vertebrate/invertebrate)	Review of 3rd : **3.a.** Research and explain life forms (including vertebrates/invertebrates) that live in different environments.	1-2 days	
Unit A-1 Lesson3	What are plants and with seeds?	**3. Analyze the characteristics, structures, life cycles, and environments of organisms.** **3.c**. Compare characteristics of organisms, including growth and development, reproduction, acquisition and use of energy, and response to the environment.(DOK2)	1-2 days	●
Unit A-1 Lesson 4	What are Fungi?	**3. Analyze the characteristics, structures, life cycles, and environments of organisms.** **3. a**. Describe the cause and effect relationships that explain the diversity and evolution of organisms over time. (DOK 2) • Observable traits due to inherited or environmental adaptations • Variations in environment (over time and from place to place) • Variations in species as	1-2 days	●

		exemplified by fossils • Extinction of a species due to insufficient adaptive capability in the face of environmental changes **c.** Compare characteristics of organisms, including growth and development, reproduction, acquisition and use of energy, and response to the environment. (DOK 2) • Life cycles of various animals to include complete and incomplete metamorphosis • Plant or animal structures that serve different functions in growth, adaptation, and survival • Photosynthesis		
Unit A-2 Lesson 1-3	Animal Growth and Adaptation	**3.c.** Compare characteristics of organisms, including growth and development, reproduction, acquisition and use of energy, and response to the environment. (DOK 2) • Life cycles of various animals to include complete and incomplete metamorphosis • Plant or animal structures that serve different functions in growth, adaptation, and survival • Photosynthesis	5 days	● Butterfly Story by Auca Hariton (life cycle) • Model or grow animal life cycles. • Use internet Life cycles (e.g. honey bee)

Unit A-3 Lesson 1-3	Plant Growth and Adaptations	**3. c**. Compare characteristics of organisms, including growth and development, reproduction, acquisition and use of energy, and response to the environment. (DOK 2)	5 days	●Dissect and identify the parts of a flower. (DOK 1) • Read The Tiny Seed by Eric Carle (further investigate) •
Unit A-4 Lesson 1-3	Human Body Systems	**3. Analyze the characteristics, structures, life cycles, and environments of organisms.** **3. b**. Classify the organs and functions of the nervous, circulatory, and respiratory systems of the body. (DOK 1) **1. f**. Explain why scientists and engineers often work in teams with different individuals doing different things that contribute to the results. (DOK 2)	5-10 days	• Diagram and label parts of body • Read alouds: The MSB: Inside the Human Body, etc… • Technology connection Harcourt Science News room @CNN Learning • Experiments www.d11.org

Lowndes County Science Pacing Guide

MS Frameworks Pacing Guide Worksheet for Science **Grade Level: 5**

Grading Period: 2nd– 9 Wks

Chapter/Unit	Lesson Topic	Objective Number	Approximate Days Needed	Suggested Teaching Strategies
Unit B-1 Lesson 2 &3	What makes up an Ecosystem? What are Habitats	**3. Analyze the characteristics, structures, life cycles, and environments of organisms.**	5-7 days	●Construct an ecosystem in a closed, clear container. Include living and non-living

	and Niches?	3. **a**. Describe the cause and effect relationships that explain the diversity and evolution of organisms over time. (DOK 2) 3. **e**. Analyze food webs to interpret how energy flows from the sun. (DOK 2)		items. Make observations and record the results. (DOK 4) ●Invite community agents (e.g 4H, Natural Resource Conservationist) ●Websites-food webs ●Book: Food Chains by Peter Riley
Unit C - 1	Earthquakes and Volcanoes	**4. Develop an understanding of the properties of Earth materials, objects in the sky, and changes in Earth and sky.** **b**. Compare and contrast Earth's geological features and the changes caused by external forces. (DOK 2) • Bodies of water, beaches, ocean ridges, continental shelves, plateaus, faults, canyons, sand dunes, and ice caps • External forces including heat, wind, and water • Movement of continental plates	5 -7 days	•Pangaea Puzzle: Arrange puzzle pieces as they might have looked at various times in Earth's geological past. Discuss the Pangaea Theory.(DOK 2) ●Scientific demonstration of how plate movements create geological features on the Earth's surface. (DOK2)
Unit C-2 Lesson 1-3	Fossils and Fossil Fuels	**Review of 3rd:** **4. Develop an understanding of the properties of Earth materials, objects in the sky, and changes in Earth and sky.** **g**. Explain how fossil records are used to learn about the past, identify characteristics of selected **4. Develop an understanding of the properties of Earth materials, objects in the sky, and changes in Earth and sky.** **g**. Summarize the process that results in deposits of fossil fuels and conclude why fossil fuels are classified as nonrenewable	2 – 3 days	● Read *I Can Read About Fossils* by John Howard ● Construct a fossil model using Plaster of Paris. Explain how fossils are formed and preserved. (DOK 3-4) ●The Earth and Science Museum at the Petrified Forest in Flora, MS ●The Natural Science Museum in Jackson, MS

		fossils, and describe why they may be found in many places. (DOK 2) resources. (DOK 2)		
	Rocks	**4. Develop an understanding of the properties of Earth materials, objects in the sky, and changes in Earth and sky.** **a.** Classify sedimentary, metamorphic, and igneous rocks. (DOK 2)	1-2 days	●The students will bring in various rocks to classify using internet resources. ●MSU Geological Science
Unit D – 1 Lesson 1-3	Weather Conditions	**4. Develop an understanding of the properties of Earth materials, objects in the sky, and changes in Earth and sky.** **c**. Investigate, record, analyze and predict weather by observing, measuring with simple weather instruments (thermometer, anemometer, wind vane, rain gauge, barometer and hygrometer), recording weather data (temperature, precipitation, sky conditions, and weather events), and using past patterns to predict future patterns. (DOK 2) **1.c.** Demonstrate the accurate use of simple tools to gather and compare information (DOK 1) • Tools (English rulers [to the nearest eighth of an inch], metric rulers [to the nearest centimeter], thermometers, scales, hand lenses, microscopes, balances, clocks, calculators, anemometers, rain gauges) • Types of data (height, mass/weight,	9 days	●Have students record weekly weather using various tools. (DOK 2) ●Students will set up a weather station using the tools needed to predict the weather. (DOK1) ●Invite a local meteorologist

		temperature, length, distance, volume, area, perimeter)		
Unit D-2 Lesson 1-3	The Oceans	**4. Develop an understanding of the properties of Earth materials, objects in the sky, and changes in Earth and sky.** **c**. Investigate, record, analyze and predict weather by observing, measuring with simple weather instruments (thermometer, anemometer, wind vane, rain gauge, barometer and hygrometer), recording weather data (temperature, precipitation, sky conditions, and weather events), and using past patterns to predict future patterns. (DOK 2) **Review 3rd grade 4.c.**	5 – 7 days	●Create the water cycle in a Ziploc bag ●Use technology to show the water cycle using MDE website(see slideshows)

Lowndes County Science Pacing Guide

MS Frameworks Pacing Guide Worksheet for Science **Grade Level: 4th**

Grading Period: 3rd– 9 Wks

Chapter/Unit	Lesson Topic	Objective Number	Approximate Days Needed	Suggested Teaching Strategies
Unit D -3 Lesson 1	How Do Earth and Its Moon Move?	**4. Develop an understanding of the properties of Earth materials, objects in the sky, and changes in Earth and sky.** **e**. Compare and contrast the seasons and explain why seasons vary at different locations on Earth. (DOK 2)	3 days	●Read Magic School Bus Gets Lost in Space

Unit D -3 Lesson 2	How Do Objects Move in the Solar System?	. **4. Develop an understanding of the properties of Earth materials, objects in the sky, and changes in Earth and sky.** **f.** Describe objects in the universe including their movement. (DOK 2) • Physical features of the moon (craters, plains, mountains) • Appearance and movement of Earth and its moon (e.g., waxing/waning of the moon and lunar/solar eclipses) • Why a planet can be seen in different constellations (locations) at different times	3 days	•NASA website • Read Marcella and the Moon by Laura Jan Coats
Unit D – 3 Lesson 4	How Do People Study the Solar System?	**4. Develop an understanding of the properties of Earth materials, objects in the sky, and changes in Earth and sky.** **f.** Describe objects in the universe including their movement. (DOK 2) • Physical features of the moon (craters, plains, mountains) • Appearance and movement of Earth and its moon (e.g., waxing/waning of the moon and lunar/solar eclipses)	3 days	● Investigate using p. D82 ● NASA website ● Rainwater Observatory French Camp, MS

		• Why a planet can be seen in different constellations (locations) at different times		
Scientific Method (Review)	Inquiry	**1. Explain and use skills necessary to conduct scientific inquiry.** **a**. Form hypotheses and predict outcomes of problems to be investigated. (DOK 3)	4 days	●Conduct a class science project
Unit E –1 Lesson 1	States of Mater	**2. Use the properties of objects and materials, position and motion of objects, and transfer of energy to develop an understanding of physical science concepts.** **b**. Distinguish between physical and chemical changes and between objects composed of a single substance from those composed of more than one substance. (DOK 2)	2 – 4 days	●Use experiments to explore chemical and physical changes
Unit E – 1 Lesson 2	How Can Matter Be Measured and Compared?	**1.c.** Demonstrate the accurate use of simple tools to gather and compare information (DOK 1) • Tools (English rulers [to the nearest eighth of an inch], metric rulers [to the nearest centimeter], thermometers, scales, hand lenses, microscopes, balances, clocks, calculators, anemometers,	2 – 4 days	● Estimate and measure object's mass and volume to compare and contrast ● Measure masses using a pan balance

		rain gauges) • Types of data (height, mass/weight, temperature, length, distance, volume, area, perimeter)		
Unit E – 1 Lesson 3	What Are Some Useful Properties of Matter?	**2. Use the properties of objects and materials, position and motion of objects, and transfer of energy to develop an understanding of physical science concepts.** **b**. Distinguish between physical and chemical changes and between objects composed of a single substance from those composed of more than one substance. (DOK 2)	2 days	●Floating and Sinking Experiment
Unit E – 1 Lesson 4	What Are Chemical and Physical Changes?	**2. Use the properties of objects and materials, position and motion of objects, and transfer of energy to develop an understanding of physical science concepts.** **b**. Distinguish between physical and chemical changes and between objects composed of a single substance from those composed of more than one substance. (DOK 2)	3 days	●Changes in a penny experiment using vinegar
E – 2 Lesson 1 -3	Heat – Energy on the Move	**2. Use the properties of objects and materials,**	7 – 9 days	●

		position and motion of objects, and transfer of energy to develop an understanding of physical science concepts. **c.** Determine the causes and effects of forces on motion. (DOK 2) • Force exerted over a distance causes work to be done and that the result (work) is the product of force and distance • Friction on moving objects and actions that increase or decrease friction • Momentum and inertia		
Unit E – 3 Lesson 1 – 3	Sound	**2. Use the properties of objects and materials, position and motion of objects, and transfer of energy to develop an understanding of physical science concepts.** **d**. Explain how energy flowing through an electrical circuit can be converted from electrical energy to light, sound, or heat energy. (DOK1) • Parts of an electric circuit and resulting actions when circuits are opened or closed • Construction and uses of electromagnets • Energy transferred through an electrical circuit	5 – 7 days	●Investigate p. E68 ● Compare Sound and Light by using a laser for light – straight line and dropping a stone in liquid to show circular travel

		to a bulb or bell to its surroundings as light, sound, and heat (thermal) energy		
Unit E – 4 Lesson 1 – 2	Light	**2. Use the properties of objects and materials, position and motion of objects, and transfer of energy to develop an understanding of physical science concepts.** **d**. Explain how energy flowing through an electrical circuit can be converted from electrical energy to light, sound, or heat energy. (DOK1) • Parts of an electric circuit and resulting actions when circuits are opened or closed • Construction and uses of electromagnets • Energy transferred through an electrical circuit to a bulb or bell to its surroundings as light, sound, and heat (thermal) energy	5 -7 days	●

Lowndes County Science Pacing Guide

MS Frameworks Pacing Guide Worksheet for Science **Grade Level: 4th**

Grading Period: 4th – 9 Wks

Chapter/Unit	Lesson Topic	Objective Number	Approximate Days Needed	Suggested Teaching Strategies
Unit F – 1 Lesson 3 – 4	What is a Magnet? What Is an Electromagnet?	**2. Use the properties of objects and materials, position and motion of objects, and transfer of energy to develop an understanding of physical science concepts.** **d**. Explain how energy flowing through an electrical circuit can be converted from electrical energy to light, sound, or heat energy. (DOK1) • Parts of an electric circuit and resulting actions when circuits are opened or closed • Construction and uses of electromagnets • Energy transferred through an electrical circuit to a bulb or bell to its	5 days	● Conduct experiments using magnets ●www.scilinks.org ●MDE (Amusement Park Physics)

		surroundings as light, sound, and heat (thermal) energy		
Unit F – 2 Lesson 1 – 3	Motion – Forces at Work	**2. Use the properties of objects and materials, position and motion of objects, and transfer of energy to develop an understanding of physical science concepts.** **c.** Determine the causes and effects of forces on motion. (DOK 2) • Force exerted over a distance causes work to be done and that the result (work) is the product of force and distance • Friction on moving objects and actions that increase or decrease friction • Momentum and inertia	8 - 10 days	● CNN and Turner Learning Videos ● Experiment with friction and momentum
Unit F – 3 Lesson 1 -3	Simple Machines	**2. Use the properties of objects and materials, position and motion of objects, and transfer of energy to develop an understanding of physical science concepts.** **c.** Determine the causes and effects of forces on motion. (DOK 2) • Force exerted over a distance causes work to be done and that the result (work) is the product of force and distance	8 days	●Experiment with pulleys and axles

		• Friction on moving objects and actions that increase or decrease friction • Momentum and inertia		

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Edna McGill, Assistant Superintendent for Curriculum and Instruction LCSD

Mr. Mike Halford, Superintendent LCSD

Lowndes County School

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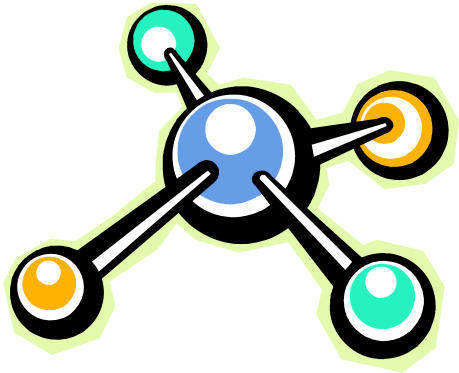
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