

# Science Daybooks © 2005

correlated to

## Mississippi Science Framework Competencies and Objectives

Grades 4-5



 HOUGHTON MIFFLIN HARCOURT  
Supplemental Publishers

[www.greatsource.com](http://www.greatsource.com)

To contact your Great Source Representative,  
Call: 800-289-4490, option 4



**Science Daybook © 2005**  
**correlated to**  
**Mississippi Science Framework**  
**Competencies and Objectives**  
**Fourth Grade**

**C O M P E T E N C Y 1**

**Explain and use skills necessary to conduct scientific inquiry.**

Objectives, Fourth Grade	Science Daybook, Grade 4
a. Form hypotheses and predict outcomes of problems to be investigated.	<b>Student Book:</b> “Knocking Over Pennies” pg. 91, “Flipping Pennies” pg. 94
b. Use the senses and simple tools to gather qualitative information about objects or events (size, shape, color, texture, sound, position, change).	<b>Student Book:</b> “Before You Read” pg. 13, 19, 37, 57, 69, 75, 95, 107, 119, “Growing Seeds” pg. 35, “Modeling A Volcano” pg. 55-56, “Panning For Gold” pg. 61-62, “Observing Wind Direction and Weather” pg. 66-67, “The Solar System on a Shoestring” pg. 86, “Knocking Over Pennies” pg. 91, “Flipping Pennies” pg. 94, “Science Journal” pg. 100, “Going Up” pg. 106, “The Rules of Attraction” pg. 109, “Magnetic Poles” pg. 111, “High Pitch, Low Pitch” pg. 124, “Earthworm Farm” pg. 132
c. Demonstrate the accurate use of simple tools to gather and compare information. <ul style="list-style-type: none"> <li>• Tools (English rulers [to the nearest eighth of an inch], metric rulers [to the nearest centimeter], thermometers, spring scales, hand lenses, balances, microscopes, calculators, clocks, anemometers, rain gauges)</li> <li>• Types of data (height, mass/weight, temperature, length, distance, volume, area, perimeter)</li> </ul>	<b>Student Book:</b> “Growing Seeds” pg. 35, “Modeling A Volcano” pg. 55-56, “Panning For Gold” pg. 61-62, “Observing Wind Direction and Weather” pg. 66-67, “The Solar System on a Shoestring” pg. 86, “Knocking Over Pennies” pg. 91, “How Are Mass and Weight Related?” pg. 93, “Flipping Pennies” pg. 94, “Going Up” pg. 106, “High Pitch, Low Pitch” pg. 124, “Earthworm Farm” pg. 132

Objectives, Fourth Grade	Science Daybook, Grade 4
<p>d. Use simple sketches, diagrams, tables, charts, and writing to draw conclusions and communicate data results.</p>	<p><b>Student Book:</b> “Look Back” pg. 28-29, “Growing Seeds” pg. 35, “Life Cycle Poster” pg. 36, “Modeling A Volcano” pg. 55-56, “Properties of Gold” pg. 60, “Panning For Gold” pg. 61-62, “Observing Wind Direction and Weather” pg. 66-67, “Seasons in the Mojave Desert” pg. 71, “seasons in a Grassland” pg. 73, “Comparing Maps” pg. 78-79, “No Model is Perfect” pg. 84-85, “The Solar System on a Shoestring” pg. 86, “Knocking Over Pennies” pg. 91, “How Are Mass and Weight Related?” pg. 93, “Flipping Pennies” pg. 94, “Changing States of Matter” pg. 99, “Lifting Geno” pg. 105, “Going Up” pg. 106, “Magnetic Poles” pg. 111, “Euro Coin as a Wet Cell” pg. 118, “Vibrating Objects” pg. 123, “High Pitch, Low Pitch” pg. 124, “Keeping Soil Healthy” pg. 131, “Earthworm Farm” pg. 132, “Habitat Destruction” pg. 143, “How Humans Think” pg. 162, “How Robots Think” pg. 163, “Comparing Robots and Humans” pg. 164</p>
<p>e. Interpret and describe patterns of data using drawings, diagrams, charts, tables, graphs, and maps.</p>	<p><b>Student Book:</b> “Look Back” pg. 28-29, “Growing Seeds” pg. 35, “Life Cycle Poster” pg. 36, “Modeling A Volcano” pg. 55-56, “Properties of Gold” pg. 60, “Panning For Gold” pg. 61-62, “Observing Wind Direction and Weather” pg. 66-67, “Seasons in the Mojave Desert” pg. 71, “seasons in a Grassland” pg. 73, “Comparing Maps” pg. 78-79, “No Model is Perfect” pg. 84-85, “The Solar System on a Shoestring” pg. 86, “Knocking Over Pennies” pg. 91, “How Are Mass and Weight Related?” pg. 93, “Flipping Pennies” pg. 94, “Changing States of Matter” pg. 99, “Lifting Geno” pg. 105, “Going Up” pg. 106, “Magnetic Poles” pg. 111, “Euro Coin as a Wet Cell” pg. 118, “Vibrating Objects” pg. 123, “High Pitch, Low Pitch” pg. 124, “Keeping Soil Healthy” pg. 131, “Earthworm Farm” pg. 132, “Habitat Destruction” pg. 143, “How Humans Think” pg. 162, “How Robots Think” pg. 163, “Comparing Robots and Humans” pg. 164</p>
<p>f. Explain why scientists and engineers often work in teams with different individuals doing different things that contribute to the results.</p>	<p><b>Student Book:</b> <i>opportunity exists</i> “Living With Wildlife” pg. 148-150</p>
<p>g. Draw conclusions about important steps (e.g., making observations, asking questions, trying to solve a problem, etc.) that led to inventions and discoveries.</p>	<p><b>Student Book:</b> <i>opportunity exists</i> “Growing Seeds” pg. 35, “Modeling A Volcano” pg. 55-56, “Panning For Gold” pg. 61-62, “Observing Wind Direction and Weather” pg. 66-67, “The Solar System on a Shoestring” pg. 86, “Knocking Over Pennies” pg. 91, “How Are Mass and Weight Related?” pg. 93, “Flipping Pennies” pg. 94, “Going Up” pg. 106, “High Pitch, Low Pitch” pg. 124, “Earthworm Farm” pg. 132</p>

## COMPETENCY 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.**

Objectives, Fourth Grade	Science Daybook, Grade 4
a. Recognize that materials may be composed of parts that are too small to be seen without magnification.	<b>Student Book:</b> Ch 14 “Capturing Snowflakes” pg. 95-97
b. Distinguish between physical and chemical changes and between objects composed of a single substance from those composed of more than one substance.	<b>Student Book:</b> Ch 14 “States of Matter” pg. 98, “Changing States of Matter” pg. 99, <i>opportunity exists</i> Ch 8 “Gold!” pg. 57-62,
c. Determine the causes and effects of forces on motion. <ul style="list-style-type: none"> <li>• Force exerted over a distance causes work to be done and that the result (work) is the product of force and distance</li> <li>• Friction on moving objects and actions that increase or decrease friction</li> <li>• Momentum and inertia</li> </ul>	<b>Student Book:</b> Ch 15 “Cliff Climber” pg. 101-106
d. Explain how energy flowing through an electrical circuit can be converted from electrical energy to light, sound, or heat energy. <ul style="list-style-type: none"> <li>• Parts of an electric circuit and resulting actions when circuits are opened or closed</li> <li>• Construction and uses of electromagnets</li> <li>• Energy transferred through an electrical circuit to a bulb or bell to its surroundings as light, sound, and heat (thermal) energy</li> </ul>	<b>Student Book:</b> Ch 17 “Electric Surprise” pg. 113-118
f. Investigate and draw conclusions about the relationship between the rate of vibrating objects and the pitch of the sound.	<b>Student Book:</b> Ch 18 “Swooshes and Snaps” pg. 119-124
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.	<b>Student Book:</b> Ch 17 “Conductors and Insulators” pg. 115

## COMPETENCY 3

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

Objectives, Fourth Grade	Science Daybook, Grade 4
<p>a. Describe the cause and effect relationships that explain the diversity and evolution of organisms over time.</p> <ul style="list-style-type: none"> <li>• Observable traits due to inherited or environmental adaptations</li> <li>• Variations in environment (over time and from place to place)</li> <li>• Variations in species as exemplified by fossils</li> <li>• Extinction of a species due to insufficient adaptive capability in the face of environmental changes</li> <li>•</li> </ul>	<p><b>Student Book:</b> Ch 1 “Oh, Build Me a Home” pg. 13-18, Ch 6 “Guinea-zilla” pg. 43-48, Ch 22 “Koala Beach” pg. 147-152, Ch 23 “Nature’s Fabrics” pg. 153-158, <i>opportunity exists</i> Ch 10 “Seasons” pg. 69-74</p>
<p>b. Classify the organs and functions of the nervous, circulatory, and respiratory systems of the body.</p>	<p><b>Student Book:</b> Ch 2 “Your Body On Alert” pg. 19-24, <i>opportunity exists</i> “How Humans Think” pg. 162</p>
<p>c. Compare characteristics of organisms, including growth and development, reproduction, acquisition and use of energy, and response to the environment.</p> <ul style="list-style-type: none"> <li>• Life cycles of various animals to include complete and incomplete metamorphosis</li> <li>• Plant or animal structures that serve different functions in growth, adaptation, and survival</li> <li>• Photosynthesis</li> </ul>	<p><b>Student Book:</b> Ch 1 “Oh, Build Me a Home” pg. 13-18, Ch 4 “Bean Sprouts” pg. 31-36, Ch 4 “Unwelcome Visitors” pg. 37-42, “Soil Supper” pg. 127-132, Ch 23 “Nature’s Fabrics” pg. 153-158</p>
<p>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).</p>	<p><b>Student Book:</b> Ch 3 “Bean Sprouts” pg. 31-36</p>
<p>e. Analyze food webs to interpret how energy flows from the sun.</p>	<p><b>Student Book:</b> <i>opportunity exists</i> Ch 5 “Unwelcome Visitors” pg. 37-42</p>

## COMPETENCY 4

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

Objectives, Fourth Grade	Science Daybook, Grade 4
<p>b. Compare and contrast Earth’s geological features and the changes caused by external forces.</p> <ul style="list-style-type: none"> <li>• Bodies of water, beaches, ocean ridges, continental shelves, plateaus, faults, canyons, sand dunes, and ice caps</li> <li>• External forces including heat, wind, and water</li> <li>• Movement of continental plates</li> </ul>	<p><b>Student Book:</b> <i>opportunity exists</i> Ch 7 “A Volcano Is Born” pg. 51-56, Ch 11 “A River in the Ocean” pg. 75-80</p>
<p>c. Investigate, record, analyze and predict weather by observing, measuring with simple weather instruments, and recording weather data (e.g., temperature, precipitation, sky conditions, weather events), and using past patterns to predict future patterns.</p>	<p><b>Student Book:</b> Ch 9 “Weather Sayings” pg. 63-68, Ch 10 “Seasons” pg. 69-74</p>
<p>d. Describe how human activities have decreased the capacity of the environment to support some life forms.</p> <ul style="list-style-type: none"> <li>• Reducing the amount of forest cover</li> <li>• Increasing the amount of chemicals released into the atmosphere</li> <li>• Farming intensively</li> </ul>	<p><b>Student Book:</b> Ch 20 “Stinky Old Sneakers” pg. 133-138, Ch 21 “Give a Hoot” pg. 139-144, Ch 22 “Koala Beach” pg. 147-152</p>
<p>e. Compare and contrast the seasons and explain why seasons vary at different locations on Earth.</p>	<p><b>Student Book:</b> Ch 10 “Seasons” pg. 69-74, <i>opportunity exists</i> Ch 9 “Weather Sayings” pg. 63-68</p>
<p>f. Describe objects in the universe including their movement.</p> <ul style="list-style-type: none"> <li>• Physical features of the moon (craters, plains, mountains)</li> <li>• Appearance and movement of Earth and its moon (e.g., waxing/waning of the moon and lunar/solar eclipses)</li> <li>• Why a planet can be seen in different constellations (locations) at different times</li> </ul>	<p><b>Student Book:</b> <i>opportunity exists</i> Ch 12 “It’s Really, Really Big!” pg. 81-86</p>



**Science Daybook © 2005**  
**correlated to**  
**Mississippi Science Framework**  
**Competencies and Objectives**  
**Fifth Grade**

**C O M P E T E N C Y 1**

**Develop and demonstrate an understanding of scientific inquiry using process skills.**

Objectives, Fifth Grade	Science Daybook, Grade 5
a. Form a hypothesis, predict outcomes, and conduct a fair investigation that includes manipulating variables and using experimental controls.	<b>Student Book:</b> “Designing Technology” pg. 157, <i>opportunity exists</i> “Creating Cavern Formations” pg. 60-62, “Bottled Twister” pg. 78-79, “Observing Chemical Properties” pg. 93-94, “Invisible Ink #1”pg. 99, “Invisible Ink #2”pg. 100, “Cranking Out Power” pg. 106, “Clay-Pot Coolers” pg. 117, “Light Trick” pg. 123, “Make Your Own Recycled Paper” pg. 151-152
b. Distinguish between observations and inferences.	<b>Student Book:</b> “Making Inferences” pg. 71, “New Observations, New Inferences” pg. 74
c. Use precise measurement in conjunction with simple tools and technology to perform tests and collect data. <ul style="list-style-type: none"> <li>• Tools (English rulers [to the nearest one-sixteenth of an inch], metric rulers [to the nearest millimeter], thermometers, scales, hand lenses, microscopes, balances, clocks, calculators, anemometers, rain gauges, barometers, hygrometers)</li> <li>• Types of data (height, mass, volume, temperature, length, time, distance, volume, perimeter, area)</li> </ul>	<b>Student Book:</b> “Timing Earthquake Waves” pg. 54, “Look Back” pg. 60, “Creating Cavern Formations” pg. 60-62, “Bottled Twister” pg. 78-79, “Interpreting Photos” pg. 85, “Observing Chemical Properties” pg. 93-94, “Invisible Ink #1”pg. 99, “Invisible Ink #2”pg. 100, “Cranking Out Power” pg. 106, “Clay-Pot Coolers” pg. 117, “Light Trick” pg. 123, “Make Your Own Recycled Paper” pg. 151-152
e. Use drawings, tables, graphs, and written and oral language to describe objects and explain ideas and actions.	<b>Student Book:</b> Supporting activities can be found throughout the text.
f. Make and compare different proposals when designing a solution or product.	<b>Student Book:</b> Ch 23 “A New Beak” pg. 153-158, Ch 24 “Animated Movies” pg. 159-164

Objectives, Fifth Grade	Science Daybook, Grade 5
g. Evaluate results of different data (whether trivial or significant).	<b>Student Book:</b> <i>opportunity exists</i> “Timing Earthquake Waves” pg. 54, “Look Back” pg. 60, “Creating Cavern Formations” pg. 60-62, “Bottled Twister” pg. 78-79, “Interpreting Photos” pg. 85, “Observing Chemical Properties” pg. 93-94, “Invisible Ink #1”pg. 99, “Invisible Ink #2”pg. 100, “Cranking Out Power” pg. 106, “Clay-Pot Coolers” pg. 117, “Light Trick” pg. 123, “Make Your Own Recycled Paper” pg. 151-152
h. Infer and describe alternate explanations and predictions.	<b>Student Book:</b> “Making Inferences” pg. 71, “New Observations, New Inferences” pg. 74

## C O M P E N T E N C Y 2

**Understand relationships of the properties of objects and materials, position and motion of objects, and transfer of energy to explain the physical world.**

Objectives, Fifth Grade	Science Daybook, Grade 5
a. Determine how the properties of an object affect how it acts and interacts.	<b>Student Book:</b> Ch 13 “Frog Chemist” pg. 89-94, Ch 14 “Secret Messages” pg. 95
b. Differentiate between elements, compounds, and mixtures and between chemical and physical changes (e.g., gas evolves, color, and/or temperature changes).	<b>Student Book:</b> Ch 13 “Frog Chemist” pg. 89-94, Ch 14 “Secret Messages” pg. 95
d. Categorize examples of potential energy as gravitational (e.g., boulder on a hill, child on a slide), elastic (e.g., compressed spring, slingshot, rubber band), or chemical (e.g., unlit match, food).	<b>Student Book:</b> Ch 16 “Magic Machine?” pg. 107-112, <i>opportunity exists</i> Ch 15 “Electricity Bike” pg. 101-106, Ch 17 “Desert Refrigerator” pg. 113-118
e. Differentiate between the properties of light as reflection, refraction, and absorption. <ul style="list-style-type: none"> <li>• Image reflected by a plane mirror and a curved-surfaced mirror</li> <li>• Light passing through air or water</li> <li>• Optical tools such as prisms, lenses, mirrors, and eyeglasses</li> </ul>	<b>Student Book:</b> Ch 18 “Light Tricks” pg. 119-124
f. Describe physical properties of matter (e.g., mass, density, boiling point, freezing point) including mixtures and solutions. <ul style="list-style-type: none"> <li>• Filtration, sifting, magnetism, evaporation, and flotation</li> <li>• Effects of temperature changes on the solubility of substances</li> </ul>	<b>Student Book:</b> Ch 13 “Frog Chemist” pg. 89-94, Ch 14 “Secret Messages” pg. 95

## COMPETENCY 3

**Predict characteristics, structures, life cycles, environments, evolution, and diversity of organisms.**

Objectives, Fifth Grade	Science Daybook, Grade 5
<p>a. Compare and contrast the diversity of organisms due to adaptations to show how organisms have evolved as a result of environmental changes.</p> <ul style="list-style-type: none"> <li>• Diversity based on kingdoms, phyla, and classes (e.g., internal/external structure, body temperature, size, shape)</li> <li>• Adaptations that increase an organism's chances to survive and reproduce in a particular habitat (e.g., cacti needles/leaves, fur/scales)</li> <li>• Evidence of fossils as indicators of how life and environmental conditions have changed</li> </ul>	<p><b>Student Book:</b> Ch 2 "Mole-rat-unculus" pg. 19-24, Ch 3 "Fierce Plants" pg. 25, Ch 4 "Nature's Toolbox" pg. 31, Ch 5 "Are You My Mother?" pg. 37-42, Ch 10 "Caught in the Act" pg. 69-74</p>
<p>b. Research and classify the organization of living things.</p> <ul style="list-style-type: none"> <li>• Differences between plant and animal cells</li> <li>• Function of the major parts of body systems (nervous, circulatory, respiratory, digestive, skeletal, muscular) and the ways they support one another</li> <li>• Examples of organisms as single-celled or multi-celled</li> </ul>	<p><b>Student Book:</b> Ch 1 "Ladybugs Galore" pg. 13-18, <i>opportunity exists</i> Ch 2 "Mole-rat-unculus" pg. 19-24</p>
<p>c. Research and cite evidence of the work of scientists (e.g., Pasteur, Fleming, Salk) as it contributed to the discovery and prevention of disease.</p>	<p><b>Student Book:</b> <i>opportunity exists</i> Ch 21 "Paging Dr. Nature" pg. 139-144</p>
<p>e. Give examples of how consumers and producers (carnivores, herbivores, omnivores, and decomposers) are related in food chains and food webs.</p>	<p><b>Student Book:</b> Ch 19 "On the Dung Trail" pg. 127-132, <i>opportunity exists</i> Ch 6 "Out of Control" pg. 43-48</p>

## C O M P E N T E N C Y 4

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

Objectives, Fifth Grade	Science Daybook, Grade 5
b. Explain how surface features caused by constructive processes (e.g., depositions, volcanic eruptions, earthquakes) differ from destructive processes (e.g., erosion, weathering, impact of organisms).	<b>Student Book:</b> Ch 7 “Earthquakes on the Edge” pg. 51-56, Ch 8 “Caverns Are Cool” pg. 57-62, Ch 9 “A Hiding Place” pg. 63-68, Ch 1 “It’s a Twister!” pg. 75-80
d. Describe changes caused by humans on the environment and natural resources and cite evidence from research of ways to conserve natural resources in the United States, including (but not limited to) Mississippi.  Examples of Mississippi efforts include the following: <ul style="list-style-type: none"> <li>• Associated Physics of America, a private company located in Greenwood Mississippi, develops ways to convert a variety of agricultural products into efficient, environment-friendly and cost-effective energy sources.</li> <li>• The Natural Resource Enterprises (NRE) Program of the Department of Wildlife and Fisheries and the Cooperative Extension Service at MSU educate landowners in the Southeast about sustainable natural resource enterprises and compatible habitat management practices.</li> <li>• The Engineer Research and Development Center of the Vicksburg District of the U.S. Army Corps of Engineers provides quality engineering and other professional products and services to develop and manage the Nation’s water resources, reduce flood damage, and protect the environment.</li> </ul>	<b>Student Book:</b> Ch 6 “Out of Control” pg. 43-48, Ch 20 “Early Warning System” pg. 133-138, Ch 21 “Paging Dr. Nature” pg. 139-144
e. Predict the movement patterns of the sun, moon, and Earth over a specified time period.	<b>Student Book:</b> Ch 12 “Eclipsed!” pg. 81-86
g. Conclude that the supply of many Earth resources (e.g., fuels, metals, fresh water, farmland) is limited and critique a plan to extend the use of Earth’s resources (e.g., recycling, reuse, renewal).	<b>Student Book:</b> <i>opportunity exists</i> Ch 22 “The Invention of Paper” pg. 14, “On the Dung Trail” pg. 127-132, Ch 20 “Early Warning System” pg. 133-138, Ch 21 “Paging Dr. Nature” pg. 139-144