

SCIENCE SAURUS © 2005
AND
SCIENCE DAYBOOKS © 2005

correlated to
Missouri
Science Grade Level Expectations
Grade 4



YOUR MISSOURI GREAT SOURCE REPRESENTATIVE

LINDA CARRON
800-289-4490, option 4
Linda_Carron@hmco.com



ScienceSaurus © 2005
and
Science Daybook © 2005
 correlated to
Missouri Science Grade Level Expectations
Grade 4

Strand 1: Properties and Principles of Matter and Energy

1. Changes in properties and states of matter provide evidence of the atomic theory of matter

Concept A. Objects, and the materials they are made of, have properties that can be used to describe and classify them

Grade Level Expectations, Grade 4	ScienceSaurus, Grades 4-5	Science Daybook, Grade 4
<i>Scope and Sequence – Mixtures and Solutions</i> a. Describe and compare the masses of objects to the nearest gram using balances	Student Handbook: 46, 47, 48, 244	Opportunities to address: Student Book: 93, 94
b. Describe and compare the volumes (the amount of space an object occupies) of objects using a graduated cylinder	Student Handbook: 41, 44, 45	
c. Recognize no two objects can occupy the same space at the same time (e.g., water level rises when an object or substance, such as a rock, is placed in a quantity of water)	Opportunities to address: Student Handbook: 244, 245	

Grade Level Expectations, Grade 4	ScienceSaurus, Grades 4-5	Science Daybook, Grade 4
d. Classify types of materials (e.g., water, salt, sugar, iron filings, salt water) into substances (materials that have specific physical properties) or mixtures of substances by using their characteristic properties	Student Handbook: 56, 57, 256, 258	Student Book: 57, 60, 61, 62

Concept B. Properties of mixtures depend upon the concentrations, properties, and interactions of particles

Grade Level Expectations, Grade 4	ScienceSaurus, Grades 4-5	Science Daybook, Grade 4
<i>Scope and Sequence – Mixtures and Solutions/Changes on the Earth’s Surface</i> a. Identify water as a solvent that dissolves materials (Do NOT assess the term solvent)	Opportunities to address: Student Handbook: 256, 258, 259	
b. Observe and describe how mixtures are made by combining solids or liquids, or a combination of these	Student Handbook: 256, 258	
c. Distinguish between the components in a mixture (e.g., trail mix, conglomerate rock, salad)	Student Handbook: 256, 258	Opportunities to address: Student Book: 58-59, 60, 61
d. Describe ways to separate the components of a mixture by their properties (i.e., sorting, filtration, magnets, screening)	Student Handbook: 258	Student Book: 57, 58-59, 60, 61

Concept I. Mass is conserved during any physical or chemical change

Grade Level Expectations, Grade 4	ScienceSaurus, Grades 4-5	Science Daybook, Grade 4
<p><i>Scope and Sequence – Mixtures and Solutions</i> a. Recognize that the total mass of a material remains constant whether it is together, in parts, or in a different state</p>	<p>Opportunities to address: Student Handbook: 244, 261</p>	<p>Opportunities to address: Student Book: 93, 94, 98, 99, 100</p>

1. Energy has a source, can be transferred, and can be transformed into various forms but is conserved between and within systems

Concept A. Forms of energy have a source, a means of transfer (work and heat), and a receiver

Grade Level Expectations, Grade 4	ScienceSaurus, Grades 4-5	Science Daybook, Grade 4
<p><i>Scope and Sequence – Forms of Energy: Electrical Circuits</i> a. Construct and diagram a complete electric circuit by using a source (e.g., battery), means of transfer (e.g., wires), and receiver (e.g., resistance bulbs, motors, fans)</p>	<p>Student Handbook: 300, 301, 302, 303</p>	<p>Opportunities to address: Student Book: 117</p>
<p>b. Observe and describe the evidence of energy transfer in a closed series circuit (e.g., lit bulb, moving motor, fan)</p>	<p>Student Handbook: 301</p>	<p>Student Book: 117</p>
<p>c. Classify materials as conductors or insulators of electricity when placed within a circuit (e.g., wood, pencil lead, plastic, glass, aluminum foil, lemon juice, air, water)</p>	<p>Student Handbook: 299</p>	<p>Student Book: 114, 115</p>

Concept F. Energy can change from one form to another within systems, but the total amount remains the same

Grade Level Expectations, Grade 4	ScienceSaurus, Grades 4-5	Science Daybook, Grade 4
<p><i>Scope and Sequence – Forms of Energy: Electrical Circuits</i> a. Identify the evidence of energy transformations (temperature change, light, sound, motion, and magnetic effects) that occur in electrical circuits</p>	<p>Student Handbook: 296, 298, 300, 301, 306</p>	<p>Student Book: 113, 117</p>

Strand 2: Properties and Principles of Force and Motion

1. The motion of an object is described by its change in position relative to another object or point

Concept A. The motion of an object is described as a change in position, direction, and speed relative to another object (frame of reference)

Grade Level Expectations, Grade 4	ScienceSaurus, Grades 4-5	Science Daybook, Grade 4
<p><i>Scope and Sequence – Laws of Motion</i> a. Classify different types of motion (straight line, curved, back and forth)</p>	<p>Student Handbook: 268, 269, 275</p>	
<p>b. Describe an object’s motion in terms of distance and time</p>	<p>Student Handbook: 276</p>	<p>Opportunities to address: Student Book: 105, 106</p>

2. Forces affect motion

Concept A. Forces are classified as either contact forces (pushes, pulls, friction, buoyancy) or non-contact forces (gravity, magnetism), that can be described in terms of direction and magnitude

Grade Level Expectations, Grade 4	ScienceSaurus, Grades 4-5	Science Daybook, Grade 4
<i>Scope and Sequence – Laws of Motion</i> a. Identify the forces acting on the motion of objects traveling in a straight line	Student Handbook: 270, 274, 277, 278, 279	Opportunities to address: Student Book: 10, 93
b. Recognize friction as a force that slows down or stops a moving object that is touching another object or surface	Student Handbook: 274, 278	
c. Compare the forces (measured by a spring scale in Newtons) required to overcome friction when an object moves over different surfaces (i.e., rough/smooth)	Opportunities to address: Student Handbook: 46, 274	

Concept B. Every object exerts a gravitational force on every other object

Grade Level Expectations, Grade 4	ScienceSaurus, Grades 4-5	Science Daybook, Grade 4
<i>Scope and Sequence – Laws of Motion</i> a. Determine the gravitational pull of the Earth on an object (weight) using a spring scale	Student Handbook: 46, 270	Opportunities to address: Student Book: 90, 91, 93

Concept D. Newton’s Laws of Motion explain the interaction of mass and forces, and are used to predict changes in motion

Grade Level Expectations, Grade 4	ScienceSaurus, Grades 4-5	Science Daybook, Grade 4
<p><i>Scope and Sequence – Laws of Motion</i> a. Recognize that balanced forces do not affect an object’s motion</p>	<p>Student Handbook: 272, 278</p>	<p>Opportunities to address: Student Book: 90, 91</p>
<p>b. Describe how unbalanced forces acting on an object changes its speed (faster/slower), direction of motion, or both</p>	<p>Student Handbook: 277, 278</p>	<p>Student Book: 92, 93</p>
<p>c. Explain how increasing or decreasing the amount of force on an object affects the motion of that object</p>	<p>Student Handbook: 277, 278</p>	<p>Student Book: 104, 105</p>
<p>d. Explain how the mass of an object (e.g., cars, marbles, rocks, boulders) affects the force required to move it</p>	<p>Student Handbook: 278</p>	<p>Student Book: 104, 105</p>
<p>e. Predict how the change in speed of an object (i.e., faster/slower/remains the same) is affected by the amount of force applied to an object and the mass of the object</p>	<p>Student Handbook: 269, 277</p>	
<p><i>Scope and Sequence – Forms of Energy: Electrical Circuits</i> f. Predict the effects of an electrostatic force (static electricity) on the motion of objects (attract or repel)</p>	<p>Student Handbook: 297</p>	<p>Student Book: 115</p>

Strand 4: Changes in Ecosystems and Interactions of Organisms with their Environments

1. Organisms are interdependent with one another and with their environment

Concept A. All populations living together within a community interact with one another and with their environment in order to survive and maintain a balanced ecosystem

Grade Level Expectations, Grade 4	ScienceSaurus, Grades 4-5	Science Daybook, Grade 4
<p><i>Scope and Sequence – Interactions among Organisms and their Environment</i></p> <p>a. Identify the ways a specific organism may interact with other organisms or with the environment (e.g., pollination, shelter, seed dispersal, camouflage, migration, hibernation, defensive mechanism)</p>	<p>Student Handbook: 87, 91, 93, 94, 95, 96, 97, 127, 130, 131</p>	<p>Student Book: 13-18, 30, 32-33, 37-42, 128-129, 130, 131, 132</p>
<p>b. Recognize different environments (i.e., pond, forest, prairie) support the life of different types of plants and animals</p>	<p>Student Handbook: 126, 127, 130, 131</p>	<p>Student Book: 32-33, 127, 128-129, 130, 139, 140-141, 142, 143, 148-149</p>

Concept D. The diversity of species within an ecosystem is affected by changes in the environment, which can be caused by other organisms or outside processes

Grade Level Expectations, Grade 4	ScienceSaurus, Grades 4-5	Science Daybook, Grade 4
<p><i>Scope and Sequence – Interactions among Organisms and their Environment</i></p> <p>a. Identify examples in Missouri where human activity has had a beneficial or harmful effect on other organisms (e.g., feeding birds, littering vs. picking up trash, hunting/conservation of species, paving/restoring greenspace)</p>	<p>Opportunities to address: Student Handbook: 319, 330, 334-338, 339-341, 342-343, 346-349, 350-353</p>	<p>Opportunities to address: Student Book: 40, 133, 134-135, 136, 137, 138, 139, 140-141, 142, 143, 144, 147, 148-149, 150, 151, 152</p>

2. Matter and energy flow through an ecosystem

Concept A. As energy flows through the ecosystem, all organisms capture a portion of that energy and transform it to a form they can use

Grade Level Expectations, Grade 4	ScienceSaurus, Grades 4-5	Science Daybook, Grade 4
<p><i>Scope and Sequence – Interactions among Organisms and their Environment</i></p> <p>a. Classify populations of organisms as producers, consumers, or decomposers by the role they serve in the ecosystem</p>	<p>Student Handbook: 133, 134, 135, 136, 137, 138</p>	<p>Student Book: 38, 39, 130, 131</p>
<p>b. Differentiate between the three types of consumers (herbivore, carnivore, omnivore)</p>	<p>Student Handbook: 134, 135</p>	<p>Student Book: 38</p>
<p>c. Categorize organisms as predator or prey in a given ecosystem</p>	<p>Opportunities to address: Student Handbook: 133, 134, 135, 137, 138</p>	<p>Student Book: 37, 38, 39, 40, 41, 42</p>

3. Genetic variation sorted by the natural selection process explains evidence of biological evolution

Concept A. Evidence for the nature and rates of evolution can be found in anatomical and molecular characteristics of organisms and in the fossil record

Grade Level Expectations, Grade 4	ScienceSaurus, Grades 4-5	Science Daybook, Grade 4
<p><i>Scope and Sequence – Changes in the Earth’s Surface</i></p> <p>a. Compare and contrast common fossils found in Missouri (i.e., trilobites, ferns, crinoids, gastropods, bivalves, fish, mastodons) to organisms present on Earth today</p>	<p>Opportunities to address: Student Handbook: 185, 186</p>	<p>Opportunities to address: Student Book: 43, 44, 45, 46, 47, 48</p>

Concept C. Natural selection is the process of sorting individuals based on their ability to survive and reproduce within their ecosystem

Grade Level Expectations, Grade 4	ScienceSaurus, Grades 4-5	Science Daybook, Grade 4
<p><i>Scope and Sequence – Interactions among Organisms and their Environment</i></p> <p>a. Identify specialized structures and describe how they help plants survive in their environment (e.g., root, cactus needles, thorns, winged seed, waxy leaves)</p>	<p>Student Handbook: 77, 81</p>	<p>Opportunities to address: Student Book: 31-36</p>
<p>b. Identify specialized structures and senses and describe how they help animals survive in their environment (e.g., antennae, body covering, teeth, beaks, whiskers, appendages)</p>	<p>Student Handbook: 77, 79, 90, 91, 149, 151, 152, 153, 154, 155</p>	<p>Student Book: 14, 16, 19, 20, 21, 22, 23, 24, 154, 156</p>
<p>c. Recognize internal cues (e.g., hunger) and external cues (e.g., changes in the environment) that cause organisms to behave in certain ways (e.g., hunting, migration, hibernation)</p>	<p>Student Handbook: 90, 91, 92, 93, 94, 95, 96, 97</p>	<p>Student Book: 16, 19, 20, 21, 22, 23, 24, 26, 27, 29, 40</p>
<p>d. Predict which plant or animal will be able to survive in a specific environment based on its special structures or behaviors</p>	<p>Student Handbook: 77, 79, 81, 90, 91, 92, 93, 94, 95, 96, 97, 149, 151, 152, 153, 154, 155</p>	<p>Student Book: 13, 14, 15, 16, 17, 18, 40</p>

Strand 5: Processes and Interactions of the Earth's Systems (Geosphere, Atmosphere, and Hydrosphere)

1. Earth's systems (geosphere, atmosphere, and hydrosphere) have common components and unique structures

Concept A. The Earth's crust is composed of various materials, including soil, minerals, and rocks, with characteristic properties

Grade Level Expectations, Grade 4	ScienceSaurus, Grades 4-5	Science Daybook, Grade 4
<p><i>Scope and Sequence – Changes in the Earth's Surface</i></p> <p>a. Identify and describe the components of soil (e.g., plant roots and debris, bacteria, fungi, worms, types of rock) and its properties (e.g., odor, color, resistance to erosion, texture, fertility, relative grain size, absorption rate)</p>	<p>Student Handbook: 131, 168, 169</p>	<p>Student Book: 127, 128-129, 130, 131, 132</p>
<p>b. Compare the physical properties (i.e., size, shape, color, texture, layering, presence of fossils) of rocks (mixtures of different Earth materials, each with observable physical properties)</p>	<p>Student Handbook: 164, 165, 166, 167</p>	<p>Student Book: 57, 58-59, 60</p>

2. Earth's systems (geosphere, atmosphere, and hydrosphere) interact with one another as they undergo change by common processes

Concept A. The Earth's materials and surface features are changed through a variety of external processes

Grade Level Expectations, Grade 4	ScienceSaurus, Grades 4-5	Science Daybook, Grade 4
<p><i>Scope and Sequence – Changes in the Earth's Surface</i></p> <p>a. Observe and describe the breakdown of plant and animal material into soil through decomposition processes (i.e., decay, rotting, composting, digestion)</p>	<p>Student Handbook: 136, 168, 348</p>	<p>Student Book: 128-129, 130, 131, 132</p>

Grade Level Expectations, Grade 4	ScienceSaurus, Grades 4-5	Science Daybook, Grade 4
b. Identify the major landforms on Earth (i.e., mountains, plains, oceans, river valleys, coastlines, canyons)	Student Handbook: 170, 171, 172, 174, 175, 178, 179, 190, 191, 193	Student Book: 51, 52-53, 54, 55, 56, 58-59, 70, 71, 72, 73, 74, 75, 76-77, 78, 79
c. Describe how weathering agents (e.g., water, chemicals, temperature, wind, plants) cause surface changes that create and/or change Earth's surface materials and/or landforms	Student Handbook: 171	Student Book: 58-59
d. Describe how erosional processes (i.e., action of gravity, waves, wind, rivers, glaciers) cause surface changes that create and/or change Earth's surface materials and/or landforms	Student Handbook: 172, 173	Student Book: 58-59

3. Human activity is dependent upon and affects Earth's resources and systems

Concept A. Earth's materials are limited natural resources affected by human activity

Grade Level Expectations, Grade 4	ScienceSaurus, Grades 4-5	Science Daybook, Grade 4
<i>Scope and Sequence – Changes in the Earth's Surface</i> a. Identify the ways humans affect the erosion and deposition of Earth's materials (e.g., clearing of land, planting vegetation, paving land, construction of new buildings)	Student Handbook: 172, 173, 351	Student Book: 147, 148-149
b. Propose ways to solve simple environmental problems (e.g., recycling, composting, ways to decrease soil erosion) that result from human activity	Student Handbook: 346, 347, 348, 349	Student Book: 133, 134-135, 136, 137, 138, 143, 144

Strand 7: Scientific Inquiry

1. Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking

Concept A. Scientific inquiry includes the ability of students to formulate a testable question and explanation, and to select appropriate investigative methods in order to obtain evidence relevant to the explanation

Grade Level Expectations, Grade 4	ScienceSaurus, Grades 4-5	Science Daybook, Grade 4
<i>Scope and Sequence - All Units</i> a. Formulate testable questions and explanations (hypotheses)	Student Handbook: 4, 5, 6	Student Book: 28, 35, 47, 55-56, 60, 61-62, 86, 91, 94, 109, 111, 124, 132
b. Recognize the characteristics of a fair and unbiased test	Student Handbook: 4, 7, 8	Student Book: 28, 55-56, 91, 94, 109, 111, 124
c. Conduct a fair test to answer a question	Student Handbook: 4, 10, 11, 12	Student Book: 28, 55-56, 61-62, 91, 94, 109, 111, 124

Concept B. Scientific inquiry relies upon gathering evidence from qualitative and quantitative observations

Grade Level Expectations, Grade 4	ScienceSaurus, Grades 4-5	Science Daybook, Grade 4
<i>Scope and Sequence - All Units</i> a. Make qualitative observations using the five senses	Student Handbook: 10, 11	Student Book: 35, 48, 56, 91, 94, 109, 111, 124, 132
b. Make observations using simple tools and equipment (e.g., hand lenses, magnets, thermometers, metric rulers, balances, graduated cylinders, spring scale)	Student Handbook: 7, 9, 10, 11, 38-50, 51-53, 54-55	Student Book: 55-56, 61-62, 66-67, 68, 86, 109, 111

Grade Level Expectations, Grade 4	ScienceSaurus, Grades 4-5	Science Daybook, Grade 4
c. Measure length to the nearest centimeter, mass using grams, temperature using degrees Celsius, volume to the nearest milliliter, weight to the nearest Newton	Student Handbook: 38, 39, 41, 42, 44, 45, 46, 49	Student Book: 66-67, 86
d. Compare amounts/measurements	Student Handbook: 38, 39, 41, 42, 44, 45, 46, 49	Student Book: 35, 47, 66-67, 68, 91, 94, 124
e. Judge whether measurements and computation of quantities are reasonable	Student Handbook: 13, 18	Student Book: 56, 61-62, 66-67, 68, 91, 94

Concept C. Evidence is used to formulate explanations

Grade Level Expectations, Grade 4	ScienceSaurus, Grades 4-5	Science Daybook, Grade 4
<i>Scope and Sequence - All Units</i> a. Use quantitative and qualitative data as support for reasonable explanations	Student Handbook: 4, 10, 11, 12, 13, 15, 18	Student Book: 28, 61-62, 68, 91, 94, 109, 111, 132, 150
b. Use data as support for observed patterns and relationships, and to make predictions to be tested	Student Handbook: 4, 10, 11, 12, 13, 15, 16, 19	Student Book: 21, 61-62, 68, 91, 94, 109, 111, 124, 132, 150

Concept D. Scientific inquiry includes evaluation of explanations (hypotheses, laws, theories) in light of scientific principles (understandings)

Grade Level Expectations, Grade 4	ScienceSaurus, Grades 4-5	Science Daybook, Grade 4
<i>Scope and Sequence - All Units</i> a. Evaluate the reasonableness of an explanation	Student Handbook: 4, 18	Student Book: 61-62, 68, 91, 94

Grade Level Expectations, Grade 4	ScienceSaurus, Grades 4-5	Science Daybook, Grade 4
b. Analyze whether evidence supports proposed explanations	Student Handbook: 4, 17, 18	Student Book: 56, 68, 91, 94, 111, 132

Concept E. The nature of science relies upon communication of results and justification of explanations

Grade Level Expectations, Grade 4	ScienceSaurus, Grades 4-5	Science Daybook, Grade 4
<i>Scope and Sequence - All Units</i> a. Communicate the procedures and results of investigations and explanations through: _ oral presentations _ drawings and maps _ data tables _ graphs (bar, single line, pictograph) _ writings	Student Handbook: 4, 21, 22	Student Book: 18, 21, 23, 35, 36, 56, 61-62, 66-67, 68, 86, 91, 94, 106, 111, 123, 124, 132

Strand 8: Impact of Science, Technology and Human Activity

1. The nature of technology can advance, and is advanced by, science as it seeks to apply scientific knowledge in ways that meet human needs

Concept A. Designed objects are used to do things better or more easily and to do some things that could not otherwise be done at all

Grade Level Expectations, Grade 4	ScienceSaurus, Grades 4-5	Science Daybook, Grade 4
<i>Scope and Sequence – Forms of Energy: Electrical Circuits</i> a. Design and construct an electrical device, using materials and/or existing objects, that can be used to perform a task (Assess Locally)	Opportunities to address: Student Handbook: 301, 302, 303	Opportunity to address: Student Book: 106

Concept B. Advances in technology often result in improved data collection and an increase in scientific information

Grade Level Expectations, Grade 4	ScienceSaurus, Grades 4-5	Science Daybook, Grade 4
<p><i>Scope and Sequence – Mixtures and Solutions/Forms of Energy: Electrical Circuits</i> a. Describe how new technologies have helped scientists make better observations and measurements for investigations (e.g., telescopes, magnifiers, balances, microscopes, computers, stethoscopes, thermometers)</p>	<p>Student Handbook: 359, 360, 361, 413-423</p>	<p>Student Book: 63, 66, 79, 159, 163</p>

Concept C. Technological solutions to problems often have drawbacks as well as benefits

Grade Level Expectations, Grade 4	ScienceSaurus, Grades 4-5	Science Daybook, Grade 4
<p><i>Scope and Sequence – Forms of Energy: Electrical Circuits/Laws of Motion/Interactions among Organisms and Their Environments</i> a. Identify how the effects of inventions or technological advances (e.g., different types of light bulbs, semiconductors/integrated circuits and electronics, satellite imagery, robotics, communication, transportation, generation of energy, renewable materials) may be helpful, harmful, or both (Assess Locally)</p>	<p>Student Handbook: 355, 356, 357, 359, 360, 361, 362, 363</p>	<p>Student Book: 79, 133, 134-135, 136, 147-152</p>

2. Historical and cultural perspectives of scientific explanations help to improve understanding of the nature of science and how science knowledge and technology evolve over time

Concept A. People of different gender and ethnicity have contributed to scientific discoveries and the invention of technological innovations

Grade Level Expectations, Grade 4	ScienceSaurus, Grades 4-5	Science Daybook, Grade 4
<p><i>Scope and Sequence – All units</i> a. Research biographical information about various scientists and inventors from different gender and ethnic backgrounds, and describe how their work contributed to science and technology (Assess Locally)</p>	<p>Student Handbook: 360, 361, 362, 367, 368, 369, 413-423, 424-435</p>	<p>Student Book: 26-27, 82-83, 110, 150, 153, 154, 155, 156, 157</p>

3. Science and technology affect, and are affected by, society

Concept A. People, alone or in groups, are always making discoveries about nature and inventing new ways to solve problems and get work done

Grade Level Expectations, Grade 4	ScienceSaurus, Grades 4-5	Science Daybook, Grade 4
<p><i>Scope and Sequence - All Units</i> a. Identify a question that was asked, or could be asked, or a problem that needed to be solved when given a brief scenario (fiction or nonfiction of people working alone or in groups solving everyday problems or learning through discovery)</p>	<p>Student Handbook: 362, 364-365, 366, 367</p>	<p>Student Book: 26-27, 134-135, 148-149, 150, 153, 154, 155, 156, 157</p>
<p>b. Work with a group to solve a problem, giving due credit to the ideas and contributions of each group member (Assess Locally)</p>	<p>Student Handbook: 30</p>	<p>Student Book: 35, 55-56, 61-62, 66-67, 86, 94, 106, 111, 124, 138</p>



TOLL FREE: **800-289-4490**

VISIT OUR WEB SITE: **WWW.GREATSOURCE.COM**
