

Kansas Science Standards – 5-7th Grade

Kansas Science Standards – 5-7 th Grade	2 nd - 3 rd Grade				3 rd - 4 th Grade				4 th - 5 th Grade			
	Soil Habitats	Shoreline Science	Designing Mixtures	Gravity & Magnetism	Light Energy	Weather & Water	Variation and Adaptation	Digestion & Body Systems	Planets & Moons	Aquatic Ecosystems	Models of Matter	Chemical Changes

STANDARD 1: SCIENCE AS INQUIRY

The student will develop the abilities to do *scientific inquiry*, be able to demonstrate how *scientific inquiry* is applied, and develop understandings about *scientific inquiry*.

Benchmark 1: The student will demonstrate abilities necessary to do the processes of *scientific inquiry*. The student...

1. identifies questions that can be answered through scientific investigations.	●●●	●●	●●	●●	●●	●●●	●●	●●	●●	●●●	●●	●●●
2. designs and conducts <i>scientific investigations</i> safely using appropriate tools, mathematics, <i>technology</i> , and techniques to gather, analyze, and interpret data.	●●	●●	●●●	●●	●●	●●●	●●	●●	●●	●●●	●●	●●●
3. identifies the relationship between evidence and logical conclusions.	●●●	●●●	●●●	●●●	●●●	●●●	●●●	●●●	●●●	●●●	●●●	●●●
4. communicates scientific procedures, results and explanations.	●●●	●●●	●●●	●●●	●●●	●●●	●●●	●●●	●●●	●●●	●●●	●●●

Benchmark 2: The student will apply different kinds of investigations to different kinds of questions. The student...

1. develops questions and adapts (frames) the inquiry process to guide the appropriate type of investigation.	●●	●●	●●	●●	●●	●●	●●	●●	●●	●●	●●	●●
2. differentiates between qualitative and quantitative data in an investigation					●●●							

Benchmark 3: The student will analyze how science advances through the interaction of new ideas, scientific investigations, skepticism, and

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examinations of evidence of varied explanations. The student...												
1. after completing an investigation, generates alternative methods of investigation and/or further questions for inquiry.	● ● ●	● ●	● ●	● ●	● ●	● ● ●	● ●	● ●	● ●	● ● ●	● ●	● ● ●
2. evaluates the work of others to determine evidence which scientifically supports or contradicts the results, identifying faulty reasoning or conclusions that go beyond evidence and/or are not supported by data.	● ●	● ●	● ●	● ●	● ● ●	● ●	● ●	● ●	● ●	● ●	● ●	● ●
STANDARD 2: PHYSICAL SCIENCE												
The student will apply process skills to develop an understanding of physical science including: properties, changes of properties of matter, motion and forces, and transfer of energy.												
Benchmark 1: The student will observe, compare, and classify properties of matter. The student...												
1. compares and classifies the states of matter; solids, liquids, gases, and plasma						● ●					● ●	
2. compares and contrasts the classes of matter; elements, compounds, and mixtures.			●								● ●	● ●
3. identifies and communicates properties of matter including but not limited to, boiling point, solubility, and density.			●								●	● ●
Benchmark 2: The student will observe, measure, infer, and classify changes in properties of matter. The student...												

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1. understands the relationship of atoms to elements and elements to compounds.												••
2. measures and graphs the effects of temperature on matter.										••		
Benchmark 3: The student will investigate motion and forces. The student...												
1. identifies the forces that act on an object (e.g., gravity and friction)				••								
2. describes, measures, and represents data on a graph showing the motion of an object (position, direction of motion, speed).												
3. recognizes and describes examples of Newton’s Laws of Motion.												
4. investigates and explains how simple machines multiply force at the expense of distance.												
Benchmark 4: The student will understand and demonstrate the transfer of energy. The student...												
1. understands the difference between potential and kinetic energy.												
2. understands that when work is done energy transforms from one form to another, including mechanical, heat, light, sound, electrical, chemical, and nuclear energy, yet is conserved.					•							
3. observes and communicates how light (electromagnetic) energy interacts with matter: transmitted, reflected, refracted, and absorbed.					•••							
4. understands that heat energy can be transferred from hot to cold by radiation, convection, and					•							

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conduction.												
<p>STANDARD 3: LIFE SCIENCE The student will apply process skills to explore and understand structure and function in living systems, reproduction and heredity, regulation and behavior, populations and ecosystems, and diversity and adaptations of organisms.</p>												
<p>Benchmark 1: The student will model structures of organisms and relate functions to the structures. The student...</p>												
1. will understand the cell theory; that all organisms are composed of one or more cells, cells are the basic unit of life, and that cells come from other cells.							● ● ●					
2. relates the structure of cells, organs, tissues, organ systems, and whole organisms to their functions								● ●				
3. compares organisms composed of single cells with organisms that are multi-cellular.												
4. concludes that breakdowns in structure or function may be caused by disease, damage, heredity, or aging.								●				
<p>Benchmark 2: The student will understand the role of reproduction and heredity for all living things. The student...</p>												
1. differentiates between asexual and sexual reproduction of organisms.												
2. understands how hereditary information of each cell is passed from one generation to the next							● ●					
3. infers that the characteristics of an organism result from heredity and interactions with the environment							● ● ●					

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Benchmark 3: The student will describe homeostasis, the regulation and balance of internal conditions in response to a changing external environment. The student...												
1. understands that internal and/or environmental conditions affect an organism's behavior and/or response in order to maintain and regulate stable internal conditions to survive in a continually changing environment.										●		
2. recognizes that the survival of all organisms requires the ingestion of materials, the intake and release of energy, growth, release of wastes and responses to environmental change.						●●	●			●●		
Benchmark 4: The student will identify and relate interactions of populations of organisms within an ecosystem. The student...												
1. recognizes that all populations living together (biotic resources) and the physical factors (abiotic resources) with which they interact compose an ecosystem.	●●	●●								●●●		
2. understands how limiting factors determine the carrying capacity of an ecosystem.										●		
3. traces the energy flow from the sun (source of radiant energy) to producers (via photosynthesis – chemical energy) to consumers and decomposers in food webs.										●●●		
Benchmark 5: The student will observe the diversity of living things and relate their adaptations to their survival or extinction. The student...												
1. concludes that species of animals, plants, and microorganisms may look dissimilar on the outside							●●					

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but have similarities in internal structures, developmental characteristics, chemical processes, and genomes.												
2. understands that adaptations of organisms (changes in structure, function, or behavior that accumulate over successive generations) contribute to biological diversity.						● ●						
3. associates extinction of a species with environmental changes and insufficient adaptive characteristics.						● ●						
<p>STANDARD 4: EARTH AND SPACE SCIENCE The student will apply process skills to explore and develop an understanding of the structure of the earth system, earth's history, and earth in the solar system.</p>												
<p>Benchmark 1: The student will understand that the structure of the earth system is continuously changing due to earth's physical and chemical processes. The student...</p>												
1. identifies properties of the solid earth, the oceans and fresh water, and the atmosphere.						● ●						
2. models earth's cycles, constructive and destructive processes, and weather systems.		●				● ●						
<p>Benchmark 2: The student will understand past and present earth processes and their similarity. The student...</p>												
1. understands that earth processes observed today (including movement of lithospheric plates and												

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changes in atmospheric conditions) are similar to those that occurred in the past; earth history is also influenced by occasional catastrophes, such as the impact of a comet or asteroid.												
Benchmark 3: The student will identify and classify stars, planets, and other solar system components. The student...												
1. compares and contrasts the characteristics of stars, planets, moons, comets, and asteroids.									● ● ●			
2. models spatial relationships of the earth/moon/planets/sun system to scale.									● ● ●			
3. identifies past and present methods used to explore space.					●				● ● ●			
Benchmark 4: The student will model motions and identify forces that explain earth phenomena. The student...												
1. demonstrates and models object/space/time relationships that explain phenomena such as the day, the month, the year, seasons, phases of the moon, eclipses and tides.									● ● ●			
2. describes how the angle of incidence of solar energy striking earth's surface affects the amount of heat energy absorbed at earth's surface.												
STANDARD 5: SCIENCE AND TECHNOLOGY												
The student will demonstrate abilities of technological design and understandings about science and technology.												
Benchmark 1: The student will demonstrate abilities of technological design. The student...												

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1. identifies appropriate problems for technological design, designs a solution or product, implements the proposed design, evaluates the product, and communicates the process of technological design.									•••			
Benchmark 2: The student will develop understandings of the similarities, differences, and relationships in science and technology. The student...												
1. compares the work of various types of scientists and engineers.					•	•			••	•		••
2. evaluates benefits, risks, limitations and trade-offs of technological solutions.									•••			
3. identifies contributions to science and technology by many people and many cultures.	•	•	•	•	•	•	•	•	•	•	•	•
STANDARD 6: SCIENCE IN PERSONAL AND ENVIRONMENTAL PERSPECTIVES The student will apply process skills to explore and develop an understanding of issues of personal health, population, resources and environment, and natural hazards.												
Benchmark 1: The student will understand scientific knowledge relative to personal health. The student...												
1. identifies individual nutrition, exercise, and a rest needs based on science and uses a scientific approach to thinking critically about personal health, lifestyle choices, risks and benefits.								•				
Benchmark 2: The student will understand the impact of human activity on resources and environment. The student...												
1. investigates the effects of human activities on the	•	••								•••		

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environment and analyzes decisions based on the knowledge of benefits and risks.												
Benchmark 3: The student will understand that natural hazards are dynamic examples of earth processes which cause us to evaluate risks. The student...												
1. recognizes patterns of natural processes and/or human activities that may cause and/or contribute to natural hazards.		●●				●●						
2. evaluates risks and defines appropriate actions associated with the natural hazard.						●						
STANDARD 7: HISTORY AND NATURE OF SCIENCE												
The student will examine and develop an understanding of science as a historical human endeavor.												
Benchmark 1: The student will develop scientific habits of mind. The student...												
1. practices intellectual honesty, demonstrates skepticism appropriately, displays open-mindedness to new ideas, and bases decisions on evidence.	●●●	●●●	●●●	●●●	●●●	●●●	●●●	●●●	●●●	●●●	●●●	●●●
Benchmark 2: The student will research contributions to science throughout history. The student...												
1. recognizes that new knowledge leads to new questions and new discoveries, replicates historic experiments to understand principles of science, and relates contributions of men and women to the fields of science.					●●							

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