

Kansas Science Standards Covered by E.A.R.T.H. Lessons

Standard 1: Science as Inquiry

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

* **Indicator 1:** Identify questions that can be answered through scientific investigations.

* **Indicator 2:** Design and conduct a scientific investigation.

* **Indicator 3:** Use appropriate tools, mathematics, technology, and techniques to gather, analyze and interpret data.

* **Indicator 4:** Think critically to identify the relationships between evidence and logical conclusions.

Indicator 5: Apply mathematical reasoning to scientific inquiry.

Indicator 6: Communicate scientific procedures and explanations

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

Indicator 1: Differentiate between a qualitative and quantitative investigation.

Indicator 2: Develop questions and adapt the inquiry process to guide the investigation.

Benchmark 3: The students will analyze how science advances through new ideas, scientific investigations skepticism, and examining evidence of varied explanations.

Indicator 1: After doing an investigation, generate alternative methods of investigation and/or further questions.

Indicator 3: Identify faulty reasoning or conclusions that go beyond evidence and/or are not supported by data.

Standard 2: Physical Science

Benchmark 1: The students will observe, compare, and classify properties of matter.

* **Indicator 1:** Identify and communicate properties of matter, including phases of matter, boiling point, solubility, and density.

Indicator 2: Using the characteristic properties of each original substance, distinguish components of various types of mixtures.

Indicator 3: Categorize chemicals to develop an understanding of properties.

Benchmark 2: The students will observe, measure, infer, and classify changes in properties of matter.

Indicator 2: Understand that total mass is conserved in chemical reactions.

Benchmark 4: The students will understand and demonstrate the transfer of energy.

Indicator 2: Sequence the transmission of energy through various real life systems.

Indicator 4: Understand that heat energy can be transferred from hot to cold by radiation, convection, and conduction.

Standard 3: Life Science

Benchmark 1: The students will observe the diversity of living things and relate their adaptations to their survival or extinction.

* **Indicator 2:** Understand that adaptations of organisms-changes in structure, function, or behavior-contribute to biological diversity.

***Indicator 3:** Associate extinction of a species with environmental changes and sufficient adaptive characteristics.

Benchmark 2: The students will understand the role of reproduction and heredity for all living things.

* **Indicator 2:** Differentiate between asexual and sexual reproduction in plants and animals

Benchmark 3: The students will describe the effects of a changing external environment on the regulation/balance of internal conditions and processes of organisms.

* **Indicator 1:** Understand the effects of a change in environmental conditions on behavior of an organism by carrying out a full investigation.

* **Indicator 2:** Identify behaviors of an organism that are responses made to internal or environmental stimuli.

Indicator 3: Explain that all organisms must be able to maintain and regulate stable internal conditions to survive in a constantly changing external environment.

Benchmark 4: The students will identify and relate interactions of populations of organisms within an ecosystem.

Indicator 1: Recognize that all populations living together and the physical factors with which they interact compose an ecosystem.

Indicator 2: Classify organisms in a system by the function they serve. (Producers, consumers, decomposers)

* **Indicator 3:** Trace the energy flow from the sun (source) to producers (chemical energy) to other organisms in food webs.

Benchmark 5: The students will observe the diversity of living things and relate their adaptations to their survival or extinction.

Indicator 1: Conclude that millions of species of animals, plants and microorganisms may look similar on the outside but have similarities in internal structures, developmental characteristics, and chemical processes.

* **Indicator 3:** Associate extinction of a species with environmental changes and insufficient adaptive characteristics.

Standard 4: Earth and Space Science

Benchmark 1: The students will understand that the structure of the earth's system is constantly changing due to the earth's physical and chemical processes.

* **Indicator 1:** Predict patterns from data collected.

* **Indicator 2:** Identify properties of the solid earth, the oceans and fresh water, and the atmosphere.

Indicator 3: Model Earth's cycles.

Indicator 5: Understand water's major role in changing the solid surface of the earth, such as the effect of oceans on climates and water as an erosion force.

Standard 4: Earth and Space Science

Benchmark 2: The students will understand that past and present Earth processes are similar.

* **Indicator 1:** Understand the dynamics of earth's constructive and destructive forces over time.

Standard 5: Science and Technology

Benchmark 1: The students will demonstrate abilities of technological design.

Indicator 1: Identify appropriate problems for technological design.

* **Indicator 2:** Design a solution or product, implement the proposed design, evaluate the product.

Indicator 3: Communicate the process of technological design.

Benchmark 2: The students will develop understandings of the similarities, differences, and relationships in science and technology.

Indicator 2: Evaluate limitations and trade-offs of technological solutions.

Standard 6: Science in Personal and Environmental Perspectives

Benchmark 1: The students will make decisions based on scientific understanding of personal health.

Indicator 2: Use a systemic approach to thinking critically about personal health risks and benefits

Benchmark 2: The students will understand the impact of human activity on resources and environment.

Indicator 1: Investigate the effects of human activities on the environment.

Indicator 2: Base decisions on perceptions of benefits and risks.

Standard 7: History and Nature of Science

Benchmark 1: The students will develop scientific habit of mind.

Indicator 4: Base decisions on evidence