



Arkansas Science Frameworks

Matched to
SkillsTutor & SkillsBank Science I

Grades 5th thru 8th

STRAND 1: PHYSICAL SYSTEMS

CONTENT STANDARD 2

Students will explore, demonstrate, communicate, apply, and evaluate the knowledge of physical systems.

PS.2.1. Demonstrate an understanding of the *states of matter* and describe the various combinations of matter (*mixtures and compounds*).

Physical Science

Physical Science: Lesson 2: Matter

Physical Science: Lesson 3: The Periodic Table

Physical Science: Lesson 4: States of Matter

PS.2.2. Identify and describe the properties of an atom.

Physical Science

Physical Science: Lesson 2: Matter

Physical Science: Lesson 3: The Periodic Table

Physical Science: Lesson 4: States of Matter

PS.2.3. Investigate the *periodic chart*.

Physical Science

Physical Science: Lesson 3: The Periodic Table

PS.2.4. Experiment and identify *physical and chemical changes*.

Physical Science

Physical Science: Lesson 5: Chemical Reactions

PS.2.5. Examine the sources and analyze the preservation of energy resources.

Physical Science

Physical Science: Lesson 6: Energy

PS.2.6. Experiment with *forces (gravity, magnetism, and electricity)*.

Physical Science

Physical Science: Lesson 7: Force and Motion

PS.2.7. Investigate the laws of motion.

Physical Science

Physical Science: Lesson 7: Force and Motion

PS.2.10. Investigate and identify conductors and insulators of heat and electricity.

Physical Science

Physical Science: Lesson 6: Energy

PS.2.11. Distinguish energy transfer (*conduction, convection, radiation*).

Physical Science

Physical Science: Lesson 6: Energy

PS.2.12. Investigate sound waves and gamma rays.

Physical Science

Physical Science: Lesson 8: Sound

STRAND 2: LIFE SCIENCE SYSTEMS

CONTENT STANDARD 2

Students will explore, demonstrate, communicate, apply and evaluate the knowledge of life systems.

LS.2.1. Identify, describe, and explain various types of cells and cell processes.

Life Science:

Life Science: Lesson 1: The Cell I

Life Science: Lesson 2: The Cell II

Life Science: Lesson 3: Life Processes I

Life Science: Lesson 4: Life Processes II

LS.2.2. Describe similarities and differences between single celled and multicellular *organisms*.

Life Science:

Life Science: Lesson 1: The Cell I

Life Science: Lesson 2: The Cell II

Life Science: Lesson 3: Life Processes I

Life Science: Lesson 4: Life Processes II

LS.2.3. Arrange *organisms* into groups according to similarities and differences.

Life Science:

Life Science: Lesson 7: Classification

LS.2.4. Identify the requirements for living *organisms*.

Life Science:

Life Science: Lesson 1: The Cell I

Life Science: Lesson 2: The Cell II

Life Science: Lesson 3: Life Processes I

Life Science: Lesson 4: Life Processes II

LS.2.5. Explain life cycles of various *organisms*.

Life Science:

Life Science: Lesson 1: The Cell I

Life Science: Lesson 2: The Cell II

Life Science: Lesson 3: Life Processes I

Life Science: Lesson 4: Life Processes II

LS.2.7. Describe how heredity and environment influence/determine characteristics of an *organism*.

Life Science:

Life Science: Lesson 5: Genetics

Life Science: Lesson 6: Mechanisms of Change

Life Science: Lesson 7: Classification

LS.2.8. Recognize that reproduction is a characteristic of all living *organisms* and is essential to the continuation of life.

Life Science:

Life Science: Lesson 8: Animal Life

Life Science: Lesson 9: Plant Life

LS.2.9. Explain how physical and/or behavioral characteristics of *organisms* help them to adapt and survive in their environments.

Life Science:

Life Science: Lesson 8: Animal Life

Life Science: Lesson 9: Plant Life

LS.2.10. Describe how environmental changes and *genetic mutations* cause species to *evolve* over time, thus producing new species.

Life Science:

Life Science: Lesson 5: Genetics

Life Science: Lesson 6: Mechanisms of Change

EARTH/SPACE SYSTEMS

CONTENT STANDARD 1

Students will demonstrate an understanding of the inquiry process through the study of Earth and space systems.

ES.1.1. Identify the components of Earth (rocks, water, and air) and their properties.

Earth Science

Earth Science: Lesson 3: Earth and Space

Earth Science: Lesson 4: Atmosphere

Earth Science: Lesson 5: Weather and Climate

Earth Science: Lesson 6: Oceans

Earth Science: Lesson 7: Water

Earth Science: Lesson 8: Dynamic Earth

Earth Science: Lesson 9: Rocks and Minerals

ES.1.2. Understand that Earth and objects in space constantly undergo changes and/or cycles which can be observed and measured.

Earth Science

Earth Science: Lesson 1: Universe

Earth Science: Lesson 2: Solar System

Earth Science: Lesson 3: Earth and Space

ES.1.5. Identify and classify rocks and *minerals*.

Earth Science

Earth Science: Lesson 9: Rocks and Minerals

ES.1.6. Understand the relationship between Earth and objects in space.

Earth Science

Earth Science: Lesson 3: Earth and Space

CONTENT STANDARD 2

Students will explore, demonstrate, communicate, apply and evaluate knowledge of the properties of Earth and space systems.

ES.2.1. Investigate the formation and properties of rocks (*igneous, sedimentary, and metamorphic*), *minerals*, and *fossils*.

Earth Science

Earth Science: Lesson 8: Dynamic Earth

Earth Science: Lesson 9: Rocks and Minerals

ES.2.2. Understand the relationship which exists between rock formation, fossil evidence, and geological history of the Earth and age of the Earth.

Earth Science

Earth Science: Lesson 8: Dynamic Earth

Earth Science: Lesson 9: Rocks and Minerals

ES.2.3. Investigate how Earth's internal processes affect external features (volcanoes, earthquakes, mountain formation).

Earth Science

Earth Science: Lesson 8: Dynamic Earth

Earth Science: Lesson 9: Rocks and Minerals

ES.2.4. Understand the effects of *weathering* and *erosion* on the Earth's surface.

Earth Science

Earth Science: Lesson 8: Dynamic Earth

ES.2.6. Describe the energy transfer within the *atmosphere* as it relates to the development of weather and climate patterns.

Earth Science

Earth Science: Lesson 4: Atmosphere

Earth Science: Lesson 5: Weather and Climate

ES.2.7. Explain and illustrate the *water cycle*.

Earth Science

Earth Science: Lesson 7: Water

ES.2.8. Model and explain how the Earth's shape and tilt result in different seasons.

Earth Science

Earth Science: Lesson 3: Earth and Space

ES.2.9. Investigate the predictable motion of objects in space in explaining phenomena such as day, night, moon phases, ocean tides, and eclipses.

Earth Science

Earth Science: Lesson 1: Universe

Earth Science: Lesson 2: Solar System

Earth Science: Lesson 3: Earth and Space

Earth Science: Lesson 6: Oceans

ES.2.10. Analyze how the features of the oceans affect humans.

Earth Science

Earth Science: Lesson 6: Oceans

ES.2.11. Compare the ability to support life on Earth and other objects in space.

Earth Science

Earth Science: Lesson 3: Earth and Space

ES.2.12. Explain and compare the properties (*gravity*, size, shape, distance, and color) of objects in the *solar system*.

Earth Science

Earth Science: Lesson 1: Universe

Earth Science: Lesson 2: Solar System

Earth Science: Lesson 3: Earth and Space

ES.2.14. Relate the physical characteristics of the sun to other stars.

Earth Science

Earth Science: Lesson 1: Universe

Earth Science: Lesson 2: Solar System

Earth Science: Lesson 3: Earth and Space

Grades 9th – 12th

CONTENT STANDARD 2

Students will explore, demonstrate, communicate, apply, and evaluate the knowledge of physical systems.

PS.2.2. Classify matter into *elements*, *compounds*, and *mixtures*. Classify mixtures as *heterogeneous* or *homogeneous* and separate *mixtures* into pure substances using procedures such as *distillation* or *chromatography*.

Physical Science

Physical Science: Lesson 3: The Periodic Table

Physical Science: Lesson 4: States of Matter

Physical Science: Lesson 5: Chemical Reactions

PS.2.3. Explore various *physical* and *chemical properties* of matter such as density, specific heat, *viscosity*, *buoyancy*, and *reactivity*.

Physical Science

Physical Science: Lesson 3: The Periodic Table

Physical Science: Lesson 4: States of Matter

PS.2.5. Use models to show the structure and behavior of matter (includes *Rutherford's Gold Foil Experiment*, *sub-atomic particles*, *electron energy levels*, *quantum theory*, and *organic molecules*).

Physical Science

Physical Science: Lesson 2: Matter

PS.2.6. Understand the rationale of the *periodic chart*.

Physical Science

Physical Science: Lesson 3: The Periodic Table

PS.2.7. Explain the relationship among *mole, chemical bonding, and molecular geometry* within chemical *compounds*.

Physical Science

Physical Science: Lesson 5: Chemical Reactions

PS.2.8. Demonstrate the relationships between *kinetic theory* and the *states of matter (gas laws)*.

Physical Science

Physical Science: Lesson 6: Energy

PS.2.9. Understand the representation of and energetics of chemical reactions (*equation writing, types of reactions, stoichiometry, reaction rates, equilibria and electrochemistry*).

Physical Science

Physical Science: Lesson 5: Chemical Reactions

PS.2.11. Define the four fundamental *forces* in nature (*gravitational, electromagnetic, weak nuclear and strong nuclear*).

Physical Science

Physical Science: Lesson 7: Force and Motion

PS.2.12. Analyze the aspects of motion (*frame of reference, speed, velocity, acceleration, relativity, time and displacement*), and distinguish between *average, constant and instantaneous motion*. (*Demonstrate and evaluate motion graphically.*)

Physical Science

Physical Science: Lesson 7: Force and Motion

PS.2.13. Investigate the aspects of two-dimensional motion (*circular, rotational and projectile*), *momentum and impulse*.

Physical Science

Physical Science: Lesson 7: Force and Motion

CONTENT STANDARD 2

Students will explore, demonstrate, communicate, apply, and evaluate the knowledge of physical systems.

PS.2.14. Apply the laws of conservation to interactions of matter (*momentum, angular momentum, mass/energy, and electric charge*).

Physical Science

Physical Science: Lesson 2: Matter

Physical Science: Lesson 4: States of Matter

PS.2.15. Explain the relationship of matter and energy ($E = mc^2$).

Physical Science

Physical Science: Lesson 2: Matter

Physical Science: Lesson 4: States of Matter

Physical Science: Lesson 6: Energy

PS.2.16. Recognize the relationships of forces and motion, applying Newton's laws, and use diagrams to analyze the forces on a system.

Physical Science

Physical Science: Lesson 7: Force and Motion

PS.2.18. Investigate the properties and characteristics of light and different optical systems (lenses, mirrors, polarization filters, fiber optics, and lasers).

Physical Science

Physical Science: Lesson 9: Light and Illumination

PS.2.19. Evaluate the concept of the duality of light exploring contributions of scientists such as DeBroglie, Schrodinger, and Heisenberg.

Physical Science

Physical Science: Lesson 9: Light and Illumination

PS.2.21. Examine the properties of sound (pitch, frequency, and intensity) and other related aspects (earthquakes, shock waves, SONAR).

Physical Science

Physical Science: Lesson 8: Sound

STRAND 2: LIFE SCIENCE SYSTEMS

CONTENT STANDARD 2

Students will explore, demonstrate, communicate, apply and evaluate the knowledge of life systems.

LS.2.2. Investigate and identify cellular processes, including homeostasis, permeability, energy production, transportation of molecules, disposal of wastes, function of cellular parts, synthesis of new molecules, and cell division.

Life Science:

Life Science: Lesson 1: The Cell I

Life Science: Lesson 2: The Cell II

Life Science: Lesson 3: Life Processes I

Life Science: Lesson 4: Life Processes II

LS.2.3. Understand that *DNA* is the basis for genetic transfer (*Mendel's laws*, genetic engineering, *DNA* replication, genetic disorders, reproduction and development in various life forms).

Life Science:

Life Science: Lesson 4: Life Processes II

Life Science: Lesson 5: Genetics

LS.2.4. Compare genetic variations observed in plants and animals (adaptations and mutations).

Life Science:

Life Science: Lesson 4: Life Processes II

Life Science: Lesson 5: Genetics

LS.2.6. Compare and contrast life cycles of familiar *organisms* (sexual, asexual, metamorphosis, and *alternation of generations*).

Life Science:

Life Science: Lesson 1: The Cell I

Life Science: Lesson 2: The Cell II

Life Science: Lesson 3: Life Processes I

Life Science: Lesson 4: Life Processes II

Life Science: Lesson 8: Animal Life

Life Science: Lesson 9: Plant Life

LS.2.7. Understand that all living things contain similar genetic material that *evolves* because of gene mutation, *natural selection*, and change in environments. Species change through time, and new life forms *evolve*.

Life Science:

Life Science: Lesson 5: Genetics

Life Science: Lesson 6: Mechanisms of Change

LS.2.8. Analyze levels of organization in the human body systems (atoms, molecules, *organelles*, cells, tissues, and organs).

Life Science:

Life Science: Lesson 1: The Cell I

Life Science: Lesson 2: The Cell II

Life Science: Lesson 3: Life Processes I

Life Science: Lesson 4: Life Processes II

LS.2.9. Analyze relationships among *organisms* and develop a model of a hierarchical classification system based on similarities and differences using *taxonomic nomenclature*.

Life Science:

Life Science: Lesson 7: Classification

LS.2.14. Interpret the functions of systems found in living *organisms* (e.g., circulatory, digestive, nervous, endocrine, reproductive, *integumentary*, skeletal, respiratory, muscular, excretory, and immune).

Life Science:

Life Science: Lesson 1: The Cell I
Life Science: Lesson 2: The Cell II
Life Science: Lesson 3: Life Processes I
Life Science: Lesson 4: Life Processes II
Life Science: Lesson 8: Animal Life
Life Science: Lesson 9: Plant Life

LS.2.15. Compare cells from different parts of plants including roots, stems, and leaves, to show specialization of structure and function.

Life Science:

Life Science: Lesson 9: Plant Life

CONTENT STANDARD 2

Students will explore, demonstrate, communicate, apply and evaluate the knowledge of life systems.

STRAND 3: EARTH/SPACE SYSTEMS

CONTENT STANDARD 2

Students will explore, demonstrate, communicate, apply and evaluate knowledge of the properties of Earth and space systems.

ES.2.2. Understand that the sun is the source of energy for the *solar system*.

Earth Science

Earth Science: Lesson 2: Solar System

ES.2.3. Explain how Earth's energy and materials are conserved, interrelated, and recycled; include ores, and the following cycles--water, oxygen, carbon, and nitrogen.

Earth Science

Earth Science: Lesson 7: Water

ES.2.4. Explain the features of the Earth's composition and geological phenomena. Utilize the *plate tectonics*, the *continental drift*, and the *sea-floor spreading* theories.

Earth Science

Earth Science: Lesson 3: Earth and Space
Earth Science: Lesson 6: Oceans
Earth Science: Lesson 8: Dynamic Earth
Earth Science: Lesson 9: Rocks and Minerals

ES.2.5. Analyze the composition and categorize types of rocks and *minerals*. Use *Moh's Hardness Scale* and the *rock cycle*.

Earth Science

Earth Science: Lesson 9: Rocks and Minerals

ES.2.8. Investigate the characteristics of oceans such as composition, features, *waves*, and energy transfer resulting from the currents.

Earth Science

Earth Science: Lesson 6: Oceans

ES.2.9. Evaluate the physical interactions of water with the Earth (*glaciers, erosion, and leaching*).

Earth Science

Earth Science: Lesson 6: Oceans

Earth Science: Lesson 7: Water

ES.2.10. Evaluate weather and climate, globally and locally, as a result of a complex exchange of heat energy (*clouds, solar radiation, ocean currents, gases, Coriolis effect, human activities, jet stream, El Nino, etc.*).

Earth Science

Earth Science: Lesson 5: Weather and Climate

ES.2.11. Given measurements of weather conditions, relate them to the temperature, pressure, density, *ideal gas law*, and *buoyancy* of air.

Earth Science

Earth Science: Lesson 5: Weather and Climate

CONTENT STANDARD 2

Students will explore, demonstrate, communicate, apply and evaluate knowledge of the properties of Earth and space systems.

ES.2.13. Compare Earth's sun to other stars in size, *mass*, temperature, energy source, position on *HR diagram*, and stages in a star's existence.

Earth Science

Earth Science: Lesson 1: Universe

Earth Science: Lesson 2: Solar System

ES.2.14. Locate common *constellations*.

Earth Science

Earth Science: Lesson 1: Universe

Earth Science: Lesson 2: Solar System

ES.2.15. Describe the organization of the known universe (*solar system, galaxy, cluster, supercluster*).

Earth Science

Earth Science: Lesson 1: Universe

Earth Science: Lesson 2: Solar System

ES.2.16. Analyze the impact of modern technology on the study of the Earth and universe (*telescopes, space probes, robotic arms, weather satellites, Doppler radar, sonar, seismographs*).

Earth Science

Earth Science: Lesson 1: Universe

Earth Science: Lesson 2: Solar System

Earth Science: Lesson 3: Earth and Space