



Arkansas Science Frameworks

Matched to
SkillsTutor & SkillsBank Science II

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*).

Chemistry:

Chemistry: Lesson 1: Matter
Chemistry: Lesson 4: States of Matter I
Chemistry: Lesson 5: States of Matter II
Chemistry: Lesson 9: Reactions

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

Chemistry:

Chemistry: Lesson 4: States of Matter I
Chemistry: Lesson 5: States of Matter II

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

Chemistry:

Chemistry: Lesson 9: Reactions

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

Chemistry:

Chemistry: Lesson 8: Energy
Chemistry: Lesson 9: Reactions

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

Physics:

Physics: Lesson 1: Motion
Physics: Lesson 2: Force
Physics: Lesson 3: Momentum

PS.2.7. Investigate the laws of motion.

Physics:

Physics: Lesson 1: Motion

Physics: Lesson 2: Force
Physics: Lesson 3: Momentum

PS.2.8. Demonstrate and communicate the relationship between magnetic fields and electric currents.

Physics:
Physics: Lesson 9: Electricity

PS.2.9. Introduce the *electromagnetic spectrum* (radio, infrared, visible light, and ultraviolet waves; x-rays).

Physics:
Physics: Lesson 6: Waves I
Physics: Lesson 7: Waves II
Physics: Lesson 8: Optics
Physics: Lesson 9: Electricity

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

Physics:
Physics: Lesson 5: Thermal Energy
Physics: Lesson 9: Electricity

PS.2.12. Investigate sound waves and gamma rays.

Physics:
Physics: Lesson 6: Waves I
Physics: Lesson 7: Waves II

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.

Biology:
Biology: Lesson 1: Cell Structures and Functions
Biology: Lesson 2: Cellular Processes

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

Biology:
Biology: Lesson 1: Cell Structures and Functions
Biology: Lesson 2: Cellular Processes
Biology: Lesson 5: Plant Life
Biology: Lesson 6: Animal Life

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

Biology:

Biology: Lesson 1: Cell Structures and Functions

Biology: Lesson 2: Cellular Processes

Biology: Lesson 5: Plant Life

Biology: Lesson 6: Animal Life

LS.2.6. Describe the parts of the human body systems and determine their function.

Biology:

Biology: Lesson 7: Humans I

Biology: Lesson 8: Humans II

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

Biology:

Biology: Lesson 3: Genetics

Biology: Lesson 4: Classification & Diversity

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

Biology:

Biology: Lesson 1: Cell Structures and Functions

Biology: Lesson 2: Cellular Processes

Biology: Lesson 3: Genetics

Biology: Lesson 5: Plant Life

Biology: Lesson 6: Animal Life

EARTH/SPACE SYSTEMS

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*.

Chemistry:

Chemistry: Lesson 3: Molecules and Compounds

Chemistry: Lesson 4: States of Matter I

Chemistry: Lesson 5: States of Matter II

Chemistry: Lesson 6: Nonmetals

Chemistry: Lesson 7: Metals

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

Chemistry:

Chemistry: Lesson 3: Molecules and Compounds

Chemistry: Lesson 4: States of Matter I

Chemistry: Lesson 5: States of Matter II

Chemistry: Lesson 6: Nonmetals

Chemistry: Lesson 7: Metals

PS.2.4. Distinguish between *physical* and *chemical changes* that affect everyday life, such as hot and cold packs, light sticks, rusting, fireworks display, and water displacement.

Chemistry:

Chemistry: Lesson 9: Reactions

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*).

Chemistry:

Chemistry: Lesson 3: Molecules and Compounds

Chemistry: Lesson 4: States of Matter I

Chemistry: Lesson 5: States of Matter II

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

Chemistry:

Chemistry: Lesson 9: Reactions

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

Chemistry:

Chemistry: Lesson 4: States of Matter I

Chemistry: Lesson 5: States of Matter II

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

Chemistry:

Chemistry: Lesson 9: Reactions

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.)

Physics:

Physics: Lesson 1: Motion

Physics: Lesson 2: Force

Physics: Lesson 3: Momentum

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

Physics:

Physics: Lesson 1: Motion

Physics: Lesson 2: Force

Physics: Lesson 3: Momentum

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*).

Physics:

Physics: Lesson 3: Momentum

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

Chemistry:

Chemistry: Lesson 4: States of Matter I

Chemistry: Lesson 5: States of Matter II

Chemistry: Lesson 8: 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.

Physics:

Physics: Lesson 1: Motion

Physics: Lesson 2: Force

Physics: Lesson 3: Momentum

PS.2.17. Examine the types of *waves* (transverse, longitudinal, standing, circular, electromagnetic), properties and characteristics of *waves* (*reflection, refraction, diffraction, interference, pitch, frequency, and velocity*), and how *waves* transfer energy.

Physics:

Physics: Lesson 6: Waves I

Physics: Lesson 7: Waves II

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

Physics:

Physics: Lesson 8: Optics

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

Physics:

Physics: Lesson 8: Optics

PS.2.22. Investigate electric and magnetic interactions and fields (poles, magnetic domains, charges, field lines, potential difference, *force* and Coulomb's Law).

Physics:

Physics: Lesson 9: Electricity

PS.2.25. Analyze the interdependent fields of electricity and *magnetism* (electromagnets, motors, generators, and transformers).

Physics:

Physics: Lesson 9: Electricity

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.

Biology:

Biology: Lesson 1: Cell Structures and Functions

Biology: Lesson 2: Cellular Processes

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).

Biology:

Biology: Lesson 1: Cell Structures and Functions

Biology: Lesson 2: Cellular Processes

Biology: Lesson 3: Genetics

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

Biology:

Biology: Lesson 1: Cell Structures and Functions

Biology: Lesson 2: Cellular Processes

Biology: Lesson 3: Genetics

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

Biology:

Biology: Lesson 1: Cell Structures and Functions

Biology: Lesson 2: Cellular Processes

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

Biology:

Biology: Lesson 7: Humans I

Biology: Lesson 8: Humans 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*.

Biology:

Biology: Lesson 4: Classification & Diversity

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).

Biology:

Biology: Lesson 7: Humans I

Biology: Lesson 8: Humans II

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

Biology:

Biology: Lesson 5: Plant Life