

Eads Elementary School Science Standards Seventh Grade

SCIENCE STANDARD #1

Students understand the processes of scientific investigation and design, conduct, communicate about, and evaluate such investigations.

Ref.	Expectations	P	PP	IP	US
7-1a.	Identifying and evaluating alternative explanations and procedures.				
7-1b.	Using examples to demonstrate that scientific ideas are used to explain previous observations and to predict future events (<i>for example, plate tectonics and future earthquake activity</i>)				
7-1c.	Asking questions and stating hypothesis that lead to different types of scientific investigations (<i>for example, experimentation, collecting specimens, constructing models, researching scientific literature</i>).				
7-1d.	Creating a written plan for an investigation.				
7-1e.	Using appropriate tools, technologies, and measurement units to gather and organize data				
7-1f.	Interpreting and evaluating data in order to formulate conclusions				
7-1g.	Communicating results of their investigations in appropriate ways (<i>for example, written reports, graphic displays, oral presentations</i>)				
7-1h.	Using metric units in measuring, calculating, and reporting results				
7-1i.	Explaining that scientific investigations sometimes result in unexpected findings that lead to new questions and more investigations				
7-1j.	Giving examples of how collaboration can be useful in solving scientific problems and sharing findings.				

SCIENCE STANDARD #2.1

Physical Science: Students know and understand common properties, forms, and changes in matter and energy. (Focus: *Physics and Chemistry*). Students know that matter has characteristic properties, which are related to its composition and structure.

Ref.	Expectations	P	PP	IP	US
7-2.1a.	Examining, describing, comparing, measuring, and classifying objects based on common physical and chemical properties (<i>for example, states of matter, mass, volume, electrical charge, temperature, density, boiling points, pH, magnetism, solubility</i>)				
7-2.1b.	Separating mixtures of substances based on their properties (<i>for example, solubility, boiling points, magnetic properties, densities</i>)				
7-2.1c.	Classifying and describing matter in terms of elements, compounds, mixtures, atoms, and molecules (<i>for example, copper is an element, water is a compound, air is a mixture</i>)				
7-2.1d.	Developing simple models to explain observed properties of matter (<i>for example, using a particle model to account for the solubility of a substance</i>)				

SCIENCE STANDARD #2.2

Students know that energy appears in different forms, and can move (be transferred) and change (be transformed).

Ref.	Expectations	P	PP	IP	US
7-2.2a.	Measuring quantities associated with energy forms (<i>for example, temperature, mass, speed, distance, electrical charge, current, voltage</i>)				
7-2.2b.	Describing qualitative and quantitative relationships, using data and observations and graphs, associated with energy transfer or energy transformation (<i>for example, speed of object vs. height of ramp; length of string vs. pitch of sound; electric current vs. volume of gas produced in electrolysis, with length of time kept constant</i>).				

SCIENCE STANDARD #2.3

Students understand that interactions can produce changes in a system, although the total quantities of matter and energy remain unchanged.

Ref.	Expectations	P	PP	IP	US
7-2.3a.	Identifying and classifying factors causing change within a system (for example, force, light, heat)				
7-2.3b.	Identifying and predicting what will change and what will remain unchanged when matter experiences an external force or energy (for example, boiling a liquid, comparing the force, distance, and work involved in simple machines)				
7-2.3c.	Observing and gathering data to support the concept of conservation of mass within a closed system (for example, precipitation reaction, forming mixtures, gas production)				
7-2.3d.	Describing, measuring (for example, temperature, mass, volume, melting point of a substance) and calculating the quantities before and after a chemical or physical change within a system (for example, temperature change, mass change, specific heat)				
7-2.3e.	Describing, measuring (for example, time distance, mass, force) and calculating quantities that characterize moving objects and their inactions within a system (for example, force, velocity, acceleration, potential energy, kinetic energy)				

SCIENCE STANDARD #3

Life Science: Students know and understand the characteristics and structure of living things, the processes of life, and how living things interact with each other and their environment. (Focus: Biology—Anatomy, Physiology, Botany, Zoology, and Ecology)

SCIENCE STANDARD #3.1

Students know and understand the characteristics of living things, the diversity of life, and how living things interact with each other and with their environment.

Ref.	Expectations	P	PP	IP	US
7-3.1a.	Constructing and using classification systems based on the structure of organisms.				
7-3.1b.	Describing the importance of plant and animal adaptations, including local examples.				
7-3.1c.	Creating and interpreting food chains and food webs.				
7-3.1d.	Explaining the interaction and interdependence of nonliving and living components within ecosystems.				
7-3.1e.	Describing how an environment's ability to provide food, water, space, and essential nutrients determines carrying capacity.				

SCIENCE STANDARD #3.2

Students know and understand interrelationships of matter and energy in living systems.

Ref.	Expectations	P	PP	IP	US
7-3.2a.	Describing the basic processes of photosynthesis and respiration and their importance to life (for example, set up a terrarium or aquarium and make changes such as blocking out light)				
7-3.2b.	Comparing and contrasting food webs within and between different ecosystems (for example, grasslands, tundra, marine) and predicting the consequences of disrupting one of the organisms in a food web.				
7-3.2c.	Describing ways (for example, digestion, transport of nutrients by circulatory system) that multicellular organisms get food and other matter to their cells				
7-3.2d.	Explaining the recycling of materials by determining a pathway of a substance that is important for life (for example, trace water through an ecosystem)				
7-3.2e.	Describing the role of organisms in the decomposition and recycling of dead organisms (for example, bacteria's role in the decomposition and recycling of matter from a dead animal)				

SCIENCE STANDARD #3.3

Students know and understand how the human body functions, factors that influence its structures and functions, and how these structures and functions compare with those of other organisms.

Ref.	Expectations	P	PP	IP	US
7-3.3a.	Describing the observable components and functions of a cell (<i>for example, cell membrane, nucleus, cytoplasm, chloroplasts, movement of molecules into and out of cells</i>)				
7-3.3b.	Comparing and contrasting the basic structures and functions of different types of cells (<i>for example, single-celled organisms in pond water, Elodea, onion cell, human cheek cell</i>).				
7-3.3c.	Describing the growth and development of several organisms (<i>for example, embryonic development of a vertebrate</i>)				
7-3.3d.	Describing the structures and functions of human body systems.				
7.3.3e.	Describing and giving examples of noncommunicable diseases and communicable diseases (<i>for example, heart disease and chicken pox</i>)				

SCIENCE STANDARD #3.4

Students know and understand how organisms change over time in terms of biological and evolution and genetics.

Ref.	Expectations	P	PP	IP	US
7-3.4a.	Describing the purpose of body cell division and sex cell division.				
7-3.4b.	Describing the role of chromosomes and genes in heredity (<i>for example, genes control traits, while chromosomes are made up of many genes</i>).				
7-3.4c.	Describing evidence that reveals changes or constancy in groups of organisms over geologic time.				

SCIENCE STANDARD #4

Earth and Space Science: Students know and understand the processes and interactions of Earth's systems and the structure and dynamics of Earth and other objects in space. (*Focus: Geology, Meteorology, Astronomy, and Oceanography*)

SCIENCE STANDARD #4.1

Students know and understand the composition of Earth, its history, and the natural processes that shape it.

SCIENCE STANDARD #4.2

Students know and understand the general characteristics of the atmosphere and fundamental processes of weather.

Ref.	Expectations	P	PP	IP	US
7-4.2a.	Describing basic composition, properties, and structure of the atmosphere (<i>for example, the range and distribution of temperature and pressure in the troposphere and stratosphere</i>).				
7-4.2b.	Observing, measuring, and recording changes in weather conditions (<i>for example, humidity, temperature, air pressure, cloud types, wind, precipitations</i>).				
7-4.2c.	Explaining how atmospheric circulation is driven by solar heating (<i>for example, the transfer of energy by radiation, convection, conduction</i>)				
7-4.2d.	Describing large-scale and local weather systems (<i>for example, fronts, air masses, storms</i>).				

SCIENCE STANDARD #4.3

Students know major sources of water, its uses, importance, and cyclic patterns of movement through the environment.

Ref.	Expectations	P	PP	IP	US
7-4.3a.	Investigating and comparing the properties and behavior of water in its solid, liquid, and gaseous states.				
7-4.3b.	Describing the distribution and circulation of the world's water through ocean, glaciers, rivers, groundwater, and atmosphere.				
7-4.3c.	Describing the composition and physical characteristics of oceans (<i>for example, currents, waves, features of the ocean floor, salinity</i>)				

SCIENCE STANDARD #4.4

Students know and understand the structure of the solar system, composition and interactions of objects in the universe, and how space is explored.

Ref.	Expectations	P	PP	IP	US
7-4.4a.	Describing basic components, composition, size, and theories of origin of the solar system.				
7-4.4b.	Explaining the effects of relative motion and position of the Sun, Earth, and Moon (<i>for example, seasons, eclipses, moon phases, tides</i>).				
7-4.4c.	Comparing Earth to other planets (<i>for example, composition, relative distance from the Sun</i>).				
7-4.4d.	Identifying technology needed to explore space (<i>for example, telescopes, spectrosopes, spacecraft, life support systems</i>).				

SCIENCE STANDARD #5

Students know and understand the interrelationships among science, technology, and human activity and how they can affect the world.

Ref.	Expectations	P	PP	IP	US
7-5a.	Investigating and describing the extent of human uses of renewable and non-renewable resources (<i>for example, forests, fossil fuels</i>).				
7-5b.	Describing advantages and disadvantages that might accompany the introduction of a new technology (<i>for example, mountain bikes, cellular telephones, pagers</i>).				
7-5c.	Describing how the use of technology can help solve an individual or community problem (<i>for example, using catalytic converters on automobiles to help reduce air pollution</i>).				
7-5d.	Describing how people use science and technology in their professions.				

SCIENCE STANDARD #6

Students understand that science involves a particular way of knowing and understand common connections among scientific disciplines.

Ref.	Expectations	P	PP	IP	US
7-6a.	Explaining why a controlled experiment must have comparable results when repeated.				
7-6b.	Giving examples of how scientific knowledge changes as new knowledge is acquired and previous ideas are modified (<i>for example, through space exploration</i>)				
7-6c.	Describing contributions to the advancement of science made by people in different cultures and at different times in history.				
7-6d.	Identifying, comparing, and predicting variables and conditions related to change (<i>for example, climate, population, motion</i>).				
7-6e.	Identifying and illustrating natural cycles within systems (<i>for example, water, planetary motions, geological changes, climate</i>).				
7-6f.	Using models to predict change (<i>for example, computer simulation, video sequence, stream table</i>).				