

Science - Integrated Physics and Chemistry (IPC) (TEKS - Aligned Course Objectives)

<u>Scientific Processes</u>			
OBJ	IPC	1	The student, for at least 40% of instructional time, conducts field and laboratory investigations using safe, environmentally appropriate, and ethical practices
SE	IPC	1A	Demonstrate safe practices during field and laboratory investigations
SE	IPC	1B	Make wise choices in the use and conservation of resources and the disposal or recycling of materials
OBJ	IPC	2	The student uses scientific methods during field and laboratory investigations
SE	IPC	2A	Plan and implement investigative procedures including asking questions, formulating testable hypotheses, and selecting equipment and technology
SE	IPC	2B	Collect data and make measurements with precision
SE	IPC	2C	Organize, analyze, evaluate, make inferences, and predict trends from data
SE	IPC	2D	Communicate valid conclusions
OBJ	IPC	3	The student uses critical thinking and scientific problem solving to make informed decisions
SE	IPC	3A	Analyze, review, and critique scientific explanations, including hypotheses and theories, as to their strengths and weaknesses using scientific evidence and information
SE	IPC	3B	Draw inferences based on data related to promotional materials for products and services
SE	IPC	3C	Evaluate the impact of research on scientific thought, society, and the environment
SE	IPC	3D	Describe connections between physics and chemistry, and future careers
SE	IPC	3E	Research and describe the history of physics, chemistry, and contributions of scientists
<u>Science Concepts</u>			
OBJ	IPC	4	The student knows concepts of force and motion evident in everyday life
SE	IPC	4A	Calculate speed, momentum, acceleration, work, and power in systems such as in the human body, moving toys, and machines
SE	IPC	4B	Investigate and describe applications of Newton's laws such as in vehicle restraints, sports activities, geological processes, and satellite orbits
SE	IPC	4C	Analyze the effects caused by changing force or distance in simple machines as demonstrated in household devices, the human body, and vehicles
SE	IPC	4D	Investigate and demonstrate mechanical advantage and efficiency of various machines such as levers, motors, wheels and axles, pulleys, and ramps
OBJ	IPC	5	The student knows the effects of waves on everyday life
SE	IPC	5A	Demonstrate wave types and their characteristics through a variety of activities such as modeling with ropes and coils, activating tuning forks, and interpreting data on seismic waves
SE	IPC	5B	Demonstrate wave interactions including interference, polarization, reflection, refraction, and resonance within various materials
SE	IPC	5C	Identify uses of electromagnetic waves in various technological applications such as fiber optics, optical scanners, and microwaves
SE	IPC	5D	Demonstrate the application of acoustic principles such as in echolocation, musical instruments, noise pollution, and sonograms
OBJ	IPC	6	The student knows the impact of energy transformations in everyday life
SE	IPC	6A	Describe the law of conservation of energy
SE	IPC	6B	Investigate and demonstrate the movement of heat through solids, liquids, and gases by convection, conduction, and radiation

SE	IPC	6C	Analyze the efficiency of energy conversions that are responsible for the production of electricity such as from radiant, nuclear, and geothermal sources, fossil fuels such as coal, gas, oil, and the movement of water or wind
SE	IPC	6D	Investigate and compare economic and environmental impacts of using various energy sources such as rechargeable or disposable batteries and solar cells
SE	IPC	6E	Measure the thermal and electrical conductivity of various materials and explain results
SE	IPC	6F	Investigate and compare series and parallel circuits
SE	IPC	6G	Analyze the relationship between an electric current and the strength of its magnetic field using simple electromagnets
SE	IPC	6H	Analyze the effects of heating and cooling processes in systems such as weather, living, and mechanical
OBJ	IPC	7	The student knows relationships exist between properties of matter and its components
SE	IPC	7A	Investigate and identify properties of fluids including density, viscosity, and buoyancy
SE	IPC	7B	Research and describe the historical development of the atomic theory
SE	IPC	7C	Identify constituents of various materials or objects such as metal salts, light sources, fireworks displays, and stars using spectral-analysis techniques
SE	IPC	7D	Relate the chemical behavior of an element including bonding, to its placement on the periodic table
SE	IPC	7E	Classify samples of matter from everyday life as being elements, compounds, or mixtures
OBJ	IPC	8	The student knows that changes in matter affect everyday life
SE	IPC	8A	Distinguish between physical and chemical changes in matter such as oxidation, digestion, changes in states, and stages in the rock cycle
SE	IPC	8B	Analyze energy changes that accompany chemical reactions such as those occurring in heat packs, cold packs, and glow sticks to classify them as endergonic or exergonic reactions
SE	IPC	8C	Investigate and identify the law of conservation of mass
SE	IPC	8D	Describe types of nuclear reactions such as fission and fusion and their roles in applications such as medicine and energy production
SE	IPC	8E	Research and describe the environmental and economic impact of the end-products of chemical reactions
OBJ	IPC	9	The student knows how solution chemistry is a part of everyday life
SE	IPC	9A	Relate the structure of water to its function as the universal solvent
SE	IPC	9B	Relate the concentration of ions in a solution to physical and chemical properties such as pH, electrolytic behavior, and reactivity
SE	IPC	9C	Simulate the effects of acid rain on soil, buildings, statues, or microorganisms
SE	IPC	9D	Demonstrate how various factors influence solubility including temperature, pressure, and nature of the solute and solvent
SE	IPC	9E	Demonstrate how factors such as particle size, influence the rate of dissolving