Science Curriculum
For High Schools

Department of Catholic Schools
Diocese of Tucson
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Science Curriculum Guide
For High Schools

Diocese of Tucson
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The Department of Catholic Schools of the Diocese of Tucson expresses gratitude to the High School Science Curriculum Committee for its work in developing the High School Science Curriculum Guidelines.
It is our hope that these guidelines help our teachers within our high schools to inspire students to go out into the larger community as scientifically literate individuals, extending their curiosity about the world, and responding to world in a Catholic manner.

The Curriculum Guidelines provide the Arizona curricular Standards for Secondary science with appropriate performance objectives. Further, course guidelines are provided for the basic high school science courses with a listing or resources that may be helpful in designing specific curriculum maps within each high school.

The High School Science Curriculum Committee:

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Philosophy and Goals

Philosophy

This curriculum is designed to help our teachers develop in students an understanding and profound respect for the world in which we live. In understanding the principles set forth in this curriculum , it is our hope that we will help students be better prepared to set foot into a world in which there is rapidly changing technology, and to help them analyze the decisions they must make as young Catholics. Basing their decisions upon rational and moral lines, we have the hope that this curriculum will provide basic scientific skill and reasoning with which to do so. This curriculum stresses the process of science as a way of learning to stimulate one's curiosity, and to provide a sound foundation for further scientific study.

Goals

Students will:

1. **Develop moral and ethical decision-making strategies in matters related to science and technology's impact on our society respecting the environment and an all living things.**
2. **Recognize that as an integrated study, science is a life-long learning process.**
3. **Develop the skills necessary for scientific investigation, problem-solving, and critical thinking so that they may be better stewards of our world.**

Format

The High School Science Curriculum is written for the college-preparatory student. Modifications can be made for standard teaching and advanced placement. The Committee strongly urges that a basic science skills course be taught prior to entrance of high school and that certain mathematics courses be taught concurrently for a successful high school experience.

The science Curriculum involves three (3) levels of study:

- **Standard**
- **College Preparatory**
- **Advanced/Honors/Advanced Placement**

❖ **Standard Requirement for Graduation:**
- **Two (2) years of science requires; Three (3) years Recommended**
- **One (1) year of life science required**
- **One (1) year of biology, chemistry, and an additional year of an integrated science OR physics**

❖ **College Preparatory Requirement for Graduation:**
- **Three (3) years of science requires**
- **One (1) year of biology, chemistry, and an additional year of integrated science OR physics**

❖ **Advanced/Honors/Advanced Placement Requirement for Graduation:**
- **Three (3) years of science required**
- **One (1) tear of biology, chemistry, and physics at the advanced/ honors or AP level**

A suggested requirement for ALL students during their first year of high school:

- **One (1) year of physical science OR**
- **A passing score on the "Physical Science Exam" (See Appendix)**

High School Science Curriculum

Table of Contents

Concept 3: Analysis, Conclusions, and Refinements					
Proficiency Grades 9-12		**Integrated Science**	**Biology**	**Chemistry**	**Physics**
Strand 1: Inquiry Process					
Concept 1: Observations, Questions, and Hypotheses					
Formulate predictions, questions, or hypotheses based on observations. Evaluate appropriate resources.					
PO 1.	Evaluate scientific information for relevance to a given problem. (See R09-S3C1, R10-S3C1, R11-S3C1, R12-S3C1)	X	X	X	X
PO 2.	Develop questions from observations that transition into testable hypotheses.	X	X	X	X
PO 3.	Formulate a testable hypothesis.	X	X	X	X
PO 4.	Predict the outcome of an investigation based on prior evidence, probability, and/or modeling (not guessing or inferring).	X	X	X	X
Concept 2: Scientific Testing (Investigating and Modeling)					
Design and conduct controlled investigations.					
PO 1.	Demonstrate safe and ethical procedures (e.g., use and care of technology, materials, organisms) and behavior in all science inquiry.	X	X	X	X
PO 2.	Identify the resources needed to conduct an investigation.	X	X	X	X
PO 3.	Design an appropriate protocol (written plan of action) for testing a hypothesis:				
	· Identify dependent and independent variables in a controlled investigation.	X	X	X	X
	· Determine an appropriate method for data collection (e.g., using balances, thermometers, microscopes, spectrophotometer, using qualitative changes).	X	X	X	X
	· Determine an appropriate method for recording data (e.g., notes, sketches, photographs, videos, journals (logs), charts, computers/calculators).	X	X	X	X
PO 4.	Conduct a scientific investigation that is based on a research design.	X	X	X	X
PO 5.	Record observations, notes, sketches, questions, and ideas using tools such as journals, charts, graphs, and computers.	X	X	X	X
Evaluate experimental design, analyze data to explain results and to propose further investigations. Design models.					
PO 1.	Interpret data that show a variety of possible relationships between variables, including:				

	· positive relationship	X	X	X	X
	· negative relationship	X	X	X	X
	· no relationship	X	X	X	X
PO 2.	Evaluate whether investigational data support or do not support the proposed hypothesis.	X	X	X	X
PO 3.	Critique reports of scientific studies (e.g., published papers, student reports).	X	X	X	X
PO 4.	Evaluate the design of an investigation to identify possible sources of procedural error, including:				
	· sample size	X	X	X	X
	· trials	X	X	X	X
	· controls	X	X	X	X
	· analyses	X	X	X	X
PO 5.	Design models (conceptual or physical) of the following to represent "real world" scenarios:				
	· carbon cycle		X		
	· water cycle	X			
	· phase change			X	X
	· collisions	X		X	X
PO 6.	Use descriptive statistics to analyze data, including:				
	· mean	X	X	X	X
	· frequency		X	X	X
	· range		X	X	X
	(See MHS-S2C1-10)				
PO 7.	Propose further investigations based on the findings of a conducted investigation.	X	X	X	X

	Concept 4: Communication Communicate results of investigations.				
PO 1.	For a specific investigation, choose an appropriate method for communicating the results. (See W09-S3C2-01 and W10-S3C2-01)	X	X	X	X
PO 2.	Produce graphs that communicate data. (See MHS-S2C1-02)	X	X	X	X
PO 3.	Communicate results clearly and logically.	X	X	X	X
PO 4.	Support conclusions with logical scientific arguments.	X	X	X	X

Strand 2: History and Nature of Science

	Concept 1: History of Science as a Human Endeavor Identify individual, cultural, and technological contributions to scientific knowledge.				
PO 1.	Describe how human curiosity and needs have influenced science, impacting the quality of life worldwide.	X	X	X	X
PO 2.	Describe how diverse people and/or cultures, past and present, have made important contributions to scientific innovations.		X	X	X
PO 3.	Analyze how specific changes in science have affected society.	X	X	X	X
PO 4.	Analyze how specific cultural and/or societal issues promote or hinder scientific advancements.	X	X	X	X

	Concept 2: Nature of Scientific Knowledge Understand how scientists evaluate and extend scientific knowledge.				
PO 1.	Specify the requirements of a valid, scientific explanation (theory), including that it be:				
	· logical	X	X	X	X
	· subject to peer review	X	X	X	X
	· public	X	X	X	X
	· respectful of rules of evidence	X	X	X	X
PO 2.	Explain the process by which accepted ideas are challenged or extended by scientific innovation.	X	X	X	X
PO 3.	Distinguish between pure and applied science.	X	X	X	X
PO 4.	Describe how scientists continue to investigate and critically analyze aspects of theories.	X	X	X	X

Strand 3: Science in Personal and Social Perspectives						
	Concept 1: Changes in Environments Describe the interactions between human populations, natural hazards, and the environment.					
PO 1.	Evaluate how the processes of natural ecosystems affect, and are affected by, humans.	X	X	X		
PO 2.	Describe the environmental effects of the following natural and/or human-caused hazards:					
	· flooding	X	X			
	· drought	X	X			
	· earthquakes	X	X			
	· fires	X	X	X		
	· pollution	X	X	X		
	· extreme weather	X	X			
PO 3.	Assess how human activities (e.g., clear cutting, water management, tree thinning) can affect the potential for hazards.	X	X			
PO 4.	Evaluate the following factors that affect the quality of the environment:					
	· urban development	X	X			
	· smoke	X	X	X		
	· volcanic dust	X	X			
PO 5.	Evaluate the effectiveness of conservation practices and preservation techniques on environmental quality and biodiversity.	X	X			

	Concept 2: Science and Technology in Society Develop viable solutions to a need or problem.				
PO 1.	Analyze the costs, benefits, and risks of various ways of dealing with the following needs or problems:				
	· various forms of alternative energy		X		X
	· storage of nuclear waste	X		X	X
	· abandoned mines	X			
	· greenhouse gases	X	X	X	
	· hazardous wastes	X	X	X	X
PO 2.	Recognize the importance of basing arguments on a thorough understanding of the core concepts and principles of science and technology.	X	X	X	X
PO 3.	Support a position on a science or technology issue.	X	X	X	X
PO 4.	Analyze the use of renewable and nonrenewable resources in Arizona:				
	· water	X			
	· land	X			
	· soil	X			
	· minerals	X			
	· air	X			
PO 5.	Evaluate methods used to manage natural resources (e.g., reintroduction of wildlife, fire ecology).	X	X		

	Concept 3: Human Population Characteristics Analyze factors that affect human populations.				
PO 1.	Analyze social factors that limit the growth of a human population, including:				
	· affluence		X		
	· education		X		
	· access to health care		X		
	· cultural influences		X		
PO 2.	Describe biotic (living) and abiotic (nonliving) factors that affect human populations.	X	X	X	
PO 3.	Predict the effect of a change in a specific factor on a human population.	X	X		

Stand 4: Life Science					
	Concept 1: The Cell Understand the role of the cell and cellular processes.				
PO 1.	Describe the role of energy in cellular growth, development, and repair.		X		
PO 2.	Compare the form and function of prokaryotic and eukaryotic cells and their cellular components.		X		
PO 3.	Explain the importance of water to cells.		X		
PO 4.	Analyze mechanisms of transport of materials (e.g., water, ions, macromolecules) into and out of cells:				
	· passive transport		X		
	· active transport		X		
PO 5.	Describe the purposes and processes of cellular reproduction.		X		
	Concept 2: Molecular Basis of Heredity Understand the molecular basis of heredity and resulting genetic diversity.				
PO 1.	Analyze the relationships among nucleic acids (DNA, RNA), genes, and chromosomes.		X		
PO 2.	Describe the molecular basis of heredity, in viruses and living things, including DNA replication and protein synthesis.		X		
PO 3.	Explain how genotypic variation occurs and results in phenotypic diversity.		X		
PO 4.	Describe how meiosis and fertilization maintain genetic variation.		X		
	Concept 3: Interdependence of Organisms Analyze the relationships among various organisms and their environment.				
PO 1.	Identify the relationships among organisms within populations, communities, ecosystems, and biomes.		X		
PO 2.	Describe how organisms are influenced by a particular combination of biotic (living) and abiotic (nonliving) factors in an environment.		X	X	
PO 3.	Assess how the size and the rate of growth of a population are determined by birth rate, death rate, immigration, emigration, and carrying capacity of the environment.		X		

	Concept 4: Biological Evolution Understand the scientific principles and processes involved in biological evolution.				
PO 1.	Identify the following components of natural selection, which can lead to speciation:				
	· potential for a species to increase its numbers		X		
	· genetic variability and inheritance of offspring due to mutation and recombination of genes		X		
	· finite supply of resources required for life		X		
	· selection by the environment of those offspring better able to survive and produce offspring		X		
PO 2.	Explain how genotypic and phenotypic variation can result in adaptations that influence an organism's success in an environment.		X		
PO 3.	Describe how the continuing operation of natural selection underlies a population's ability to adapt to changes in the environment and leads to biodiversity and the origin of new species.		X		
PO 4.	Predict how a change in an environmental factor (e.g., rainfall, habitat loss, non-native species) can affect the number and diversity of species in an ecosystem.	X	X		
PO 5.	Analyze how patterns in the fossil record, nuclear chemistry, geology, molecular biology, and geographical distribution give support to the theory of organic evolution through natural selection over billions of years and the resulting present day biodiversity.	X	X		
PO 6.	Analyze, using a biological classification system (i.e., cladistics, phylogeny, morphology, DNA analysis), the degree of relatedness among various species.		X		

	Concept 5: Matter, Energy, and Organization in Living Systems (Including Human Systems) Understand the organization of living systems, and the role of energy within those systems.				
PO 1.	Compare the processes of photosynthesis and cellular respiration in terms of energy flow, reactants, and products.		X		
PO 2.	Describe the role of organic and inorganic chemicals (e.g., carbohydrates, proteins, lipids, nucleic acids, water, ATP) important to living things.		X	X	
PO 3.	Diagram the following biogeochemical cycles in an ecosystem:				
	· water	X	X		
	· carbon		X		
	· nitrogen		X		
PO 4.	Diagram the energy flow in an ecosystem through a food chain.		X		

Strand 5: Physical Science					
	Concept 1: Structure and Properties of Matter Understand physical, chemical, and atomic properties of matter.				
PO 1.	Describe substances based on their physical properties.	X		X	
PO 2.	Describe substances based on their chemical properties.	X	X	X	
PO 3.	Predict properties of elements and compounds using trends of the periodic table (e.g., metals, non-metals, bonding – ionic/covalent).	X		X	
PO 4.	Separate mixtures of substances based on their physical properties.	X	X	X	
PO 5.	Describe the properties of electric charge and the conservation of electric charge.	X	X	X	X
PO 6.	Describe the following features and components of the atom:				
	· protons	X	X	X	
	· neutrons	X	X	X	
	· electrons	X	X	X	
	· mass	X	X	X	
	· number and type of particles	X	X	X	
	· structure	X	X	X	
	· organization	X	X	X	
PO 7.	Describe the historical development of models of the atom.			X	
PO 8.	Explain the details of atomic structure (e.g., electron configuration, energy levels, isotopes).			X	

	Concept 2: Motions and Forces Analyze relationships between forces and motion.				
PO 1.	Determine the rate of change of a quantity (e.g., rate of erosion, rate of reaction, rate of growth, velocity).	X	X	X	X
PO 2.	Analyze the relationships among position, velocity, acceleration, and time:				
	· graphically	X			X
	· mathematically	X			X
PO 3.	Explain how Newton's 1st Law applies to objects at rest or moving at constant velocity.	X			X
PO 4.	Using Newton's 2nd Law of Motion, analyze the relationships among the net force acting on a body, the mass of the body, and the resulting acceleration:				
	· graphically				X
	· mathematically	X			X
PO 5.	Use Newton's 3rd Law to explain forces as interactions between bodies (e.g., a table pushing up on a vase that is pushing down on it; an athlete pushing on a basketball as the ball pushes back on her).	X			X
PO 6.	Analyze the two-dimensional motion of objects by using vectors and their components.				X
PO 7.	Give an example that shows the independence of the horizontal and vertical components of projectile motion.				X
PO 8.	Analyze the general relationships among force, acceleration, and motion for an object undergoing uniform circular motion.				X
PO 9.	Represent the force conditions required to maintain static equilibrium.				X
PO 10.	Describe the nature and magnitude of frictional forces.				X
PO 11.	Using the Law of Universal Gravitation, predict how the gravitational force will change when the distance between two masses changes or the mass of one of them changes.				X
PO 12.	Using Coulomb's Law, predict how the electrical force will change when the distance between two point charges changes or the charge of one of them changes.				X
PO 13.	Analyze the impulse required to produce a change in momentum.				X
PO 14.	Quantify interactions between objects to show that the total momentum is conserved in both collision and recoil situations.				X

	Concept 3: Conservation of Energy and Increase in Disorder Understand ways that energy is conserved, stored, and transferred.				
PO 1.	Describe the following ways in which energy is stored in a system:				
	· mechanical				X
	· electrical			X	X
	· chemical		X	X	
	· nuclear			X	X
PO 2.	Describe various ways in which energy is transferred from one system to another (e.g., mechanical contact, thermal conduction, electromagnetic radiation.)	X	X	X	X
PO 3.	Recognize that energy is conserved in a closed system.	X		X	X
PO 4.	Calculate quantitative relationships associated with the conservation of energy.			X	X
PO 5.	Analyze the relationship between energy transfer and disorder in the universe (2nd Law of Thermodynamics).			X	X
PO 6.	Distinguish between heat and temperature.		X	X	X
PO 7.	Explain how molecular motion is related to temperature and phase changes.	X	X	X	X

	Concept 4: Chemical Reactions Investigate relationships between reactants and products in chemical reactions.				
PO 1.	Apply the law of conservation of matter to changes in a system.	X		X	
PO 2.	Identify the indicators of chemical change, including formation of a precipitate, evolution of a gas, color change, absorption or release of heat energy.	X		X	X
PO 3.	Represent a chemical reaction by using a balanced equation.	X	X	X	
PO 4.	Distinguish among the types of bonds (i.e., ionic, covalent, metallic, hydrogen bonding).	X	X	X	
PO 5.	Describe the mole concept and its relationship to Avogadro's number.			X	
PO 6.	Solve problems involving such quantities as moles, mass, molecules, volume of a gas, and molarity using the mole concept and Avogadro's number.			X	
PO 7.	Predict the properties (e.g., melting point, boiling point, conductivity) of substances based upon bond type.	X		X	X
PO 8.	Quantify the relationships between reactants and products in chemical reactions (e.g., stoichiometry, equilibrium, energy transfers).			X	
PO 9.	Predict the products of a chemical reaction using types of reactions (e.g., synthesis, decomposition, replacement, combustion).			X	
PO 10.	Explain the energy transfers within chemical reactions using the law of conservation of energy.			X	
PO 11.	Predict the effect of various factors (e.g., temperature, concentration, pressure, catalyst) on the equilibrium state and on the rates of chemical reaction.			X	
PO 12.	Compare the nature, behavior, concentration, and strengths of acids and bases.	X		X	
PO 13.	Determine the transfer of electrons in oxidation/reduction reactions.			X	

	Concept 5: Interactions of Energy and Matter Understand the interactions of energy and matter.				
PO 1.	Describe various ways in which matter and energy interact (e.g., photosynthesis, phase change).	X	X	X	X
PO 2.	Describe the following characteristics of waves:				
	· wavelength	X	X	X	X
	· frequency	X		X	X
	· period				X
	· amplitude	X			X
PO 3.	Quantify the relationships among the frequency, wavelength, and the speed of light.			X	X
PO 4.	Describe the basic assumptions of kinetic molecular theory.			X	
PO 5.	Apply kinetic molecular theory to the behavior of matter (e.g., gas laws).			X	X
PO 6.	Analyze calorimetric measurements in simple systems and the energy involved in changes of state.		X	X	X
PO 7.	Explain the relationship between the wavelength of light absorbed or released by an atom or molecule and the transfer of a discrete amount of energy.			X	X
PO 8.	Describe the relationship among electric potential, current, and resistance in an ohmic system.	X		X	X
PO 9.	Quantify the relationships among electric potential, current, and resistance in an ohmic system.			X	X

	Strand 6: Earth and Space Science				
	Concept 1: Geochemical Cycles Analyze the interactions between the Earth's structures, atmosphere, and geochemical cycles.				
PO 1.	Identify ways materials are cycled within the Earth system (i.e., carbon cycle, water cycle, rock cycle).	X			
PO 2.	Demonstrate how dynamic processes such as weathering, erosion, sedimentation, metamorphism, and orogenesis relate to redistribution of materials within the Earth system.	X			
PO 3.	Explain how the rock cycle is related to plate tectonics.	X			
PO 4.	Demonstrate how the hydrosphere links the biosphere, lithosphere, cryosphere, and atmosphere.	X			
PO 5.	Describe factors that impact current and future water quantity and quality including surface, ground, and local water issues.	X			
PO 6.	Analyze methods of reclamation and conservation of water.	X			
PO 7.	Explain how the geochemical processes are responsible for the concentration of economically valuable minerals and ores in Arizona and worldwide.	X			

Concept 2: Energy in the Earth System (Both Internal and External) Understand the relationships between the Earth's land masses, oceans, and atmosphere.					
PO 1.	Describe the flow of energy to and from the Earth.	X	X		X
PO 2.	Explain the mechanisms of heat transfer (convection, conduction, radiation) among the atmosphere, land masses, and oceans.	X			X
PO 3.	Distinguish between weather and climate.	X			
Internal Energy:					
PO 4.	Demonstrate the relationship between the Earth's internal convective heat flow and plate tectonics.	X			
PO 5.	Demonstrate the relationships among earthquakes, volcanoes, mountain ranges, mid-oceanic ridges, deep sea trenches, and tectonic plates.	X			
PO 6.	Distinguish among seismic S, P, and surface waves.	X			
PO 7.	Analyze the seismic evidence (S and P waves) used to determine the structure of the Earth.	X			
PO 8.	Describe how radioactive decay maintains the Earth's internal temperature.	X			X
External Energy:					
PO 9.	Explain the effect of heat transfer on climate and weather.	X	X	X	X
PO 10.	Demonstrate the effect of the Earth's rotation (i.e., Coriolis effect) on the movement of water and air.	X			X
PO 11.	Describe the origin, life cycle, and behavior of weather systems (i.e., air mass, front, high and low systems, pressure gradients).	X			
PO 12.	Describe the conditions that cause severe weather (e.g., hurricanes, tornadoes, thunderstorms).	X			
PO 13.	Propose appropriate safety measures that can be taken in preparation for severe weather.	X			
PO 14.	Analyze how weather is influenced by both natural and artificial Earth features (e.g., mountain ranges, bodies of water, cities, air pollution).	X			
PO 15.	List the factors that determine climate (e.g., altitude, latitude, water bodies, precipitation, prevailing winds, topography).	X			
PO 16.	Explain the causes and/or effects of climate changes over long periods of time (e.g., glaciation, desertification, solar activity, greenhouse effect).	X	X	X	
PO 17.	Investigate the effects of acid rain, smoke, volcanic dust, urban development, and greenhouse gases, on climate change over various periods of time.	X	X		

Concept 3: Origin and Evolution of the Earth System Analyze the factors used to explain the history and evolution of the Earth.					
Earth Origin/System:					
PO 1.	Describe the scientific theory of the origin of the solar system (solar nebular hypothesis).	X			
PO 2.	Describe the characteristics, location, and motions of the various kinds of objects in our solar system, including the Sun, planets, satellites, comets, meteors, and asteroids.	X			
PO 3.	Explain the phases of the Moon, eclipses (lunar and solar), and the interaction of the Sun, Moon, and Earth (tidal effect).	X			
Earth History/Evolution:					
PO 4.	Interpret a geologic time scale.		X		
PO 5.	Distinguish between relative and absolute geologic dating techniques.		X		
PO 6.	Investigate scientific theories of how life originated on Earth (high temperature, low oxygen, clay catalyst model).		X		
PO 7.	Describe how life on Earth has influenced the evolution of the Earth's systems.		X		
PO 8.	Sequence major events in the Earth's evolution (e.g., mass extinctions, glacial episodes) using relative and absolute dating data.		X		
PO 9.	Analyze patterns in the fossil record related to the theory of organic evolution.		X		
Concept 4: Origin and Evolution of the Universe Analyze the factors used to explain the origin and evolution of the universe.					
PO 1.	Describe the Big Bang Theory as an explanation for the origin of the universe.	X			X
PO 2.	Describe the fusion process that takes place in stars.	X		X	X
PO 3.	Analyze the evolution of various types of stars using the Hertzsprung-Russell (HR) diagram.	X			
PO 4.	Compare the evolution (life cycles) of stars of different masses (low and high mass).	X			
PO 5.	Explain the formation of the light elements in stars and the heavier elements (what astronomers call "metals") in supernova explosions.	X			
PO 6.	Explain the evolution and life cycles of galaxies.	X			

INTEGRATED SCIENCE

Rationale:

Integrated science is a 9th grade course designed to provide the student with a foundation for biology, chemistry and physics. The course is a project-based, laboratory science that stresses the integration of math and science. The student is expected to enroll in Biology after successfully completing Integrated Science.

Objectives:

This course will provide the student with a basic knowledge of scientific method, scientific measurement, physical and life sciences. The student will continue to develop math and science skills through laboratory experiences. This course is designed to the nature of science and how it is applicable to solving environmental problems.
The culmination of the course will be an individual research project addressing a problem relating to Arizona's environment.

Course content:

INTRODUCTION

I. Thinking like a scientist.
II. Measurement.
III. Experimental design.

PHYSICS

IV. Motion.
V. Forces.
VI. Energy, work and power.
VII. Waves, sound, light and optics.
VIII. Electricity and magnetism.

CHEMISTRY

IX. Properties and states of matter.
X. Atomic structure.
XI. Periodic table.
XII. Chemical bonds.
XIII. Chemical reactions and energy.
XIV. Solutions, acids an bases.

EARTH AND ENVIRONMENTAL SCIENCE

XV. Structure of Earth.
XVI. Dynamic Surface of Earth (Volcanism, earthquakes, plate tectonics).
XVII. Rocks and geology.
XVIII. Weather and climate.
XIX. Exploring the Universe.
XX. The Arizona Project.

Method of Evaluation:

1. Tests entailing interpretation of data and drawing conclusions, true/false, multiple choice, matching, definitions, and essay questions.
2. Quizzes
3. Written assignments
4. Laboratory reports
5. Notebooks
6. Projects including a final project on an environmental issue facing Arizona.

Prerequisites:

None, but students may opt to test out of this class