

Arizona High School Science
Curriculum Standards, 2005

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Earth and Space Science	Boardworks High School Earth Science Presentations
Concept 1: Geochemical Cycles	
PO 1. Identify ways materials are cycled within the Earth system (i.e., carbon cycle, water cycle, rock cycle).	The Carbon Cycle The Nitrogen Cycle The Water Cycle The Rock Cycle Recycling Nutrients
PO 2. Demonstrate how dynamic processes such as weathering, erosion, sedimentation, metamorphism, and orogenesis relate to redistribution of materials within the Earth system.	Weathering Erosion, Transportation and Deposition The Rock Cycle Volcanoes Coastal Processes Coastal Erosional Landforms Coastal Depositional Landforms
PO 3. Explain how the rock cycle is related to plate tectonics.	The Rock Cycle Plate Tectonics Volcanoes
PO 4. Demonstrate how the hydrosphere links the biosphere, lithosphere, cryosphere, and atmosphere.	The Atmosphere The Carbon Cycle Heat Transfer and Global Interactions Recycling Nutrients The Water Cycle
PO 5. Describe factors that impact current and future water quantity and quality including surface, ground, and local water issues.	The Water Cycle Precipitation River Flooding Extreme Flooding Water Pollution
<i>PO 6. Analyze methods of reclamation and conservation of water.</i>	–

PO 7. Explain how the geochemical processes are responsible for the concentration of economically valuable minerals and ores in Arizona and worldwide.	–
Concept 2: Energy in the Earth System (Both Internal and External)	
PO 1. Describe the flow of energy to and from the Earth.	Heat Transfer and Global Interactions Earth's Structure Climate Change Greenhouse Gases
PO 2. Explain the mechanisms of heat transfer (convection, conduction, radiation) among the atmosphere, land masses, and oceans.	Conduction and Convection Heat Transfer and Global Interactions
PO 3. Distinguish between weather and climate.	Weather and Climate
PO 4. Demonstrate the relationship between the Earth's internal convective heat flow and plate tectonics.	Earth's Structure Plate Tectonics
PO 5. Demonstrate the relationships among earthquakes, volcanoes, mountain ranges, mid-oceanic ridges, deep sea trenches, and tectonic plates.	Earthquake Causes Volcanoes Plate Tectonics
PO 6. Distinguish among seismic S, P, and surface waves.	Earthquake Causes
PO 7. Analyze the seismic evidence (S and P waves) used to determine the structure of the Earth.	Earthquake Causes
PO 8. Describe how radioactive decay maintains the Earth's internal temperature.	
PO 9. Explain the effect of heat transfer on climate and weather.	Heat Transfer and Global Interactions Weather and Climate Conduction and Convection ENSO
PO 10. Demonstrate the effect of the Earth's rotation (i.e., Coriolis effect) on the movement of water and air.	Heat Transfer and Global Interactions
PO 11. Describe the origin, life cycle, and behavior of weather systems (i.e., air mass, front, high and low systems, pressure gradients).	Precipitation Clouds Heat Transfer and Global Interactions Weather and Climate
PO 12. Describe the conditions that cause severe weather (e.g., hurricanes, tornadoes, thunderstorms).	Hurricane Case Studies ENSO Tropical Cyclones

PO 13. Propose appropriate safety measures that can be taken in preparation for severe weather.	Earthquake Effects Hurricane Case Studies River Flooding Tropical Cyclones
PO 14. Analyze how weather is influenced by both natural and artificial Earth features (e.g., mountain ranges, bodies of water, cities, air pollution).	Weather and Climate Air Pollution Greenhouse Gases Climate Change Heat Transfer and Global Interactions
PO 15. List the factors that determine climate (e.g., altitude, latitude, water bodies, precipitation, prevailing winds, topography).	Weather and Climate
PO 16. Explain the causes and/or effects of climate changes over long periods of time (e.g., glaciation, desertification, solar activity, greenhouse effect).	Greenhouse Gases Climate Change
PO 17. Investigate the effects of acid rain, smoke, volcanic dust, urban development, and greenhouse gases, on climate change over various periods of time.	Greenhouse Gases Climate Change
Concept 3: Origin and Evolution of the Earth System	
PO 1. Describe the scientific theory of the origin of the solar system (solar nebular hypothesis).	Planets of the Solar System
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.	Planets of the Solar System Gravity and Orbits Doppler Effect Structure of the Universe
PO 3. Explain the phases of the Moon, eclipses (lunar and solar), and the interaction of the Sun, Moon, and Earth (tidal effect).	The Moon
PO 4. Interpret a geologic time scale.	–
PO 5. Distinguish between relative and absolute geologic dating techniques.	–
PO 6. Investigate scientific theories of how life originated on Earth (high temperature, low oxygen, clay catalyst model).	–
PO 7. Describe how life on Earth has influenced the evolution of the Earth's systems.	The Atmosphere The Carbon Cycle Air Pollution Water Pollution
PO 8. Sequence major events in the Earth's evolution (e.g., mass extinctions, glacial episodes) using relative and absolute dating data.	–

PO 9. Analyze patterns in the fossil record related to the theory of organic evolution.	Fossil Record
Concept 4: Origin and Evolution of the Universe	
PO 1. Describe the Big Bang Theory as an explanation for the origin of the universe.	Doppler Effect Planets of the Solar System
PO 2. Describe the fusion process that takes place in stars.	Nuclear Fusion The Life Cycle of Stars
PO 3. Analyze the evolution of various types of stars using the Hertzsprung-Russell (HR) diagram.	The Properties of Stars
PO 4. Compare the evolution (life cycles) of stars of different masses (low and high mass).	The Life Cycle of Stars
PO 5. Explain the formation of the light elements in stars and the heavier elements (what astronomers call "metals") in supernova explosions.	The Life Cycle of Stars
PO 6. Explain the evolution and life cycles of galaxies.	Planets of the Solar System