



Environmental Science High School

1.0 Understands and applies the skills of scientific inquiry.

- 1.1 Uses scientific inquiry to design, conduct, and analyze scientific investigations.
- 1.2 Engages and participates positively in class activities, projects, debates, discussions, investigations, etc.
- 1.3 Teams collaboratively and efficiently with other students in group settings.
- 1.4 Seeks out and communicates with real world experts, politicians, businesses and other pertinent environmental stakeholders.
- 1.5 Effectively selects and appropriately utilizes tools, technology, and techniques to gather data and information about the environment.
- 1.6 Makes detailed, appropriate, and relevant qualitative and quantitative observations related to information and data gathered about the environment.
- 1.7 Uses real world data and observations about the environment to draw appropriate conclusions about environmental issues.
- 1.8 Effectively uses various methods and technology to creatively present and share information learned about the environment to the public.
- 1.9 Uses appropriate safety procedures when conducting investigations.
- 1.10 Investigates safely during environmental investigations and inquiries.
- 1.11 Utilizes appropriate safety equipment and takes appropriate safety precautions during investigations.

2.0 Understands and applies scientific concepts, principles, and theories pertaining to Earth and the Universe.

- 2.1 Understands and applies knowledge of geochemical cycles including the elements and atoms within and moving between Earth's hydrosphere, lithosphere, and atmosphere.
- 2.2 Describes the mechanisms and processes that occur in the water, nitrogen, and carbon cycles to the nature of environmental conditions that occur around the world.
- 2.3 Understands how cycles drive weather and climate patterns around the world.
- 2.4 Explores the effect of human activities on these cycles.
- 2.5 Understands and applies knowledge of the origin and evolution of the Earth system including formation of the solar system, geologic time,

interactions among hydrosphere, lithosphere, and atmosphere and origins and evolution of life.

2.6 Creates a large-scale environment with conditions necessary for Earthlike life to occur.

2.7 Understands the natural environmental factors that shape Earth's various biomes.

2.8 Examines how human activities impact evolution of species.

3.0 Understands and applies concepts, principles and theories pertaining to life and its interactions.

3.1 Understands and applies concepts principles and theories pertaining to life and its interactions.

3.2 Correctly defines and uses populations, ecosystems, communities, and biospheres.

3.3 Distinguishes the nitrogen, carbon, and water cycles and their importance to the environment.

3.4 Outlines how matter and energy are conserved as they flow through and between organisms in the environment.

3.5 Organizes the energy transformation processes that occur between producers, consumers, and decomposers.

3.6 Understands and applies knowledge of the molecular basis of heredity.

3.7 Justifies that the sequence of DNA dictates the genetic information found in living organisms.

3.8 Explains how sexual reproduction and mutations provide genetic variation within a species.

3.9 Relates genetic diversity within a species to its ability to survive from environmental challenges.

3.10 Applies knowledge of DNA to examine the use and design of genetically modified organisms.

3.11 Understands and applies knowledge of biological evolution.

3.12 Understands that species change over time as a consequence of a variety of factors including: genetic variation, overpopulation, competition for resources, and natural Selection (survival of fittest).

3.13 Applies the principles of evolution to predict how a species may change over time.

3.14 Assesses how environmental conditions influence the level of biodiversity in a region.

3.15 Describes the various global challenges that affect regions with high biodiversity.

- 3.16 Understands the identification, organization, and structure of living organisms.
- 3.17 Understands that species are classified based on evolutionary relationships and genetic similarities.
- 3.18 Correlates an organism's structure and behavior to its habitat requirements.
- 3.19 Identifies environmental factors and finite resources that influence ecosystems interactions.
- 3.20 Explains interrelationships and interdependency of biotic and abiotic factors that lead to long-term stable environmental systems.
- 3.21 Identifies environmental factors and finite resources that influence ecosystem interactions and relationships.
- 3.22 Critically explores the various effects of exponential human population growth on the environment.
- 3.23 Examines the unequal distribution and consumption of wealth and resources globally and environmental issues related to it.
- 3.24 Analyzes the patterns and methods of waste production and disposal globally and its impact on the world's environment.
- 3.25 Creates sustainable development plans for various areas locally, nationally, and globally.

4.0 Understands and applies concepts and theories pertaining to matter, its composition and the forces that govern it.

- 4.1 Understands and applies knowledge of the structure of atoms.
- 4.2 Lists the name and symbol and common uses for common elements.
- 4.3 Understands that electrons govern the chemical properties of elements.
- 4.4 Understands and applies knowledge of the structure and properties of matter.
- 4.5 Classifies matter as elements, compounds, or mixtures.
- 4.6 Differentiates the basic properties and characteristics of elements, ions, compounds, and mixtures that are considered harmful to the environment.
- 4.7 Understands and applies knowledge of chemical reactions.
- 4.8 Understands that chemical reactions involve a transfer of energy and that energy can be released or absorbed in chemical reactions.
- 4.9 Describes the essential chemical reactions necessary for life on Earth.
- 4.10 Describes how and why combustion reactions are a primary energy source for human activities.
- 4.11 Predicts how materials decompose chemically at different rates in the environment.
- 4.12 Understands and applies knowledge of types of energy and conservation of energy.
- 4.13 Understands that most of the energy on the Earth ultimately comes from the

Sun.

4.14 Distinguishes between the different sources of energy on Earth.

4.15 Explains how energy can be transferred from one form to another to meet human needs.

4.16 Accepts ways in which energy transfer is inefficient and develops ideas to improve energy efficiency.

4.17 Evaluates the sustainability of utilizing renewable and nonrenewable energy sources.

4.18 Creates long-term energy recommendations that are sustainable, affordable, and practical.

5.0 Understands the Nature of Science.

5.1 Understands how science develops and changes over time.

5.2 Understands the history of environmental science and environmentalism.

5.3 Understands that science is exploratory and that many questions about the natural world are being pursued simultaneously.

5.4 Appreciates the interdisciplinary nature of environmental science and draws upon learned content from other science classes to further develop an understanding about the environment.

5.5 Appreciates the collaborative nature of environmental science and models this in the classroom.

5.6 Understands that environmental science is a public domain and effectively communicates ideas and learned information to a peer audience for evaluation and further discussion.

5.7 Knows that human behaviors can affect the environment positively and negatively.

5.8 Transfers learning about the environment in class to environmentalism outside the class.