Biology 1 Core and Indicator Standards

The following Core and Indicator standards are specifically addressed in the Desert Garden Project of the Global Warming Survival Program. See the Academic Standards in the Indiana Department of Education for a complete list of Core and Indicator standards.

Core Standard 1: Nature of Science: The Scientific Enterprise. Demonstrate understanding that scientific knowledge is gained from observation and experimentation, by designing and conducting investigations, and evaluating and communicating the results of those investigations according to accepted procedures.
Indicator standards are in process at the Indiana Department of Education.

Core Standard 2: Structures and Functions of Living Systems: Cellular Chemistry

B.1.5 Demonstrate that most cells function best within a narrow range of temperature and acidity. Note that extreme changes may harm cells, modifying the structure of their protein molecules and therefore, some possible functions.

B.1.6 Show that a living cell is composed mainly of a small number of chemical elements – carbon, hydrogen, nitrogen, oxygen, phosphorous, and sulfur. Recognize that carbon can join to other carbon atoms in chains and rings to form large and complex molecules.

Core Standard 4: Structure and Functions of Living Systems: Matter and Energy Transformations

B.1.9 Recognize and describe that both living and nonliving things are composed of compounds, which are themselves made up of elements joined by energy-containing bonds, such as those in ATP.

B.1.19 Recognize and describe that metabolism consists of the production, modification, transport, and exchange of materials that are required for the maintenance of life.

B.1.44 Describe the flow of matter, nutrients, and energy within ecosystems.

Core Standard 5: Structure and Functions of Living Systems: Interdependence

B.1.37 Explain that the amount of life any environment can support is limited by the available energy, water, oxygen, and minerals, and by the ability of ecosystems to recycle the residue of dead organic materials. Recognize, therefore, that human activities and technology can change the flow and reduce the fertility of the land.

B.1.40 Understand and explain that like many complex systems, ecosystems tend to have cyclic fluctuations around a state of rough equilibrium. However, also understand that ecosystems can always change with climate changes or when one or more new species appear as a result of migration or local evolution.

B.1.42 Realize and explain that at times, the environmental conditions are such that plants and marine organisms grow faster than decomposers can recycle them back to the environment. Understand that layers of energy-rich organic material thus laid down have been gradually turned into great coal beds and oil pools by the pressure of the overlying earth. Further understand that by burning these fossil fuels, people are passing most of the stored energy back into the environment as heat and releasing large amounts of carbon dioxide.

Core Standard 6: Structure and Functions of Living Systems: Molecular Basis of Heredity

B.1.21 Understand and explain that the information passed from parents to offspring is transmitted by means of genes which are coded in DNA molecules.

B.1.23 Understand that and describe how inserting, deleting, or substituting DNA segments can alter a gene. Recognize that an altered gene may be passed on to every cell that develops from it, and

B.1.26 Demonstrate how the genetic information in DNA molecules provides instructions for assembling protein molecules and that this is virtually the same mechanism for all life forms.

B.2.4 Explain that after the publication of *Origin of Species*, biological evolution was supported by the rediscovery of the genetics experiments of an Austrian monk, Gregor Mendel, by the identification of genes and how they are sorted in reproduction, and by the discovery that the genetic code found in DNA is the same for almost all organisms.

Other Biology Standards Pertinent to Global Warming

B.1.17 Understand that and describe how the maintenance of a relatively stable internal environment is required for the continuation of life and explain how stability is challenged by changing physical, chemical, and environmental conditions, as well as the presence of disease agents.

B.1.24 Explain that gene mutations can be caused by such things as radiation and chemicals. Understand that when they occur in sex cells, the mutations can be passed on to offspring; if they occur in other cells, they can be passed on to descendant cells only.