

# Goals and Concepts

**The goals or outcomes and the corresponding concepts of Wild Wonderful Wyoming: Choices for the Future are listed, A through F. The program will realize a high school graduate who:**

## **Goal A**

**Has a working knowledge of those cross-disciplinary concepts pertaining to the sustainable use of an environment hospitable to the diversity of Earth's species, including man.**

## Concepts

- 1 Humans are a natural component of many ecosystems.
- 2 Humans are unique among species in that their actions can cause extreme positive or negative change in the global environment.
- 3 Our natural and man-made environments are the basis of our physical, mental, emotional and economic health.
- 4 Human influences on life forms and ecosystems may be direct or indirect and resulting changes may range from short-term to irreversible.
- 5 The original source of all material goods is natural resources.
- 6 Resource extraction and use cannot occur without some degree of environmental change.
- 7 Nonrenewable natural resources are not replenished through natural cycles or are replenished extremely slowly on a geological time frame, and are thus strictly limited in quantity.
- 8 Renewable natural resources are replenished through natural cycles, but are still finite.
- 9 Humans have been present for only a small fraction of total geologic time. In spite of this, humans have had a greater impact on the earth's environment than any other single species.
- 10 Economics is not just about producing wealth, and ecology is not just about protecting nature; they are both relevant in improving the quality of human life.
- 11 Human activities can alter plant and animal distribution, diversity and abundance as well as the distribution and existence of entire ecosystems.

- 12 Numerous variations in the Earth's environment, such as climate, geology and topography, have given rise to a great diversity of species and habitats.
- 13 Biodiversity is currently decreasing because human activities have accelerated the rate at which species become endangered and extinct.
- 14 Most plant and animal species that are threatened or endangered today became so due to habitat loss or change caused by human activity.
- 15 The Earth's biodiversity is the source of our most essential products (food, many medicines, fabrics, etc.). Loss of this diversity has major implications for agriculture and industry.
- 16 There is vast potential for developing new sources of food, medicine and other essentials, or improving existing sources, by tapping into earth's biodiversity of resources.
- 17 Gene banks of traditional and wild varieties of crops are essential to maintaining plant productivity. New varieties of high-yield crops are often developed using genes of wild plants to increase resistance to disease or make them suitable to various conditions.
- 18 A population tends to increase in size until limited by one or more factors such as food, space, water or shelter.
- 19 Increasing human population and increasing per capita consumption are causing a steady increase in the global demand for energy and other resources.
- 20 Marriages later in life, access to birth control information, increased literacy and employment among women, and higher standards of living can help slow population growth. However, the social security value of children (i.e., the child's potential to provide for the parents) is still the over-riding concern for many, especially the poor.
- 21 Natural events and human activities affect the role and direction of succession.
- 22 Changes in cultural patterns and the social and economic values of a society affect personal life styles, and thus, the use and conservation of natural resources.
- 23 Forests are important to us in that they furnish food, medicines, wood or fuel, timber and paper. They also form a part of the global ecosystems that supports us and of which we are a part.
- 24 Forests contain important wildlife and genetic resources and afford important aesthetic, recreational and scientific values.
- 25 Rainforests are among the most diverse ecosystems, and the most threatened by human activities.

26 Nations are interrelated through their technological, economic and environmental activities and through mutual reliance on natural resources and environmental quality.

27 Environmental problems and concerns often transcend political boundaries and cultural differences.

28 Citizens of the United States use more natural resources per capita than the people of any other nation.

### **Goal B**

**Seeks to expand direct human experience with the natural world, to satisfy curiosity about how things work.**

#### Concepts

1 The environment itself gives us the greatest instrument for environmental education. Any environment-natural or artificial, the school ground or the rain forest-provides a pool of information about resources, systems and interactions.

2 Technology buffers humans' contact with the natural environment thereby reducing our understanding of the processes that make it work.

3 Understanding ecological processes leads to the development of environmental concern and action.

4 Nature is a key for self-discovery. Often, it is through our enjoyment of nature that we develop an "environmental ethic."

5 If the human ability to alter the environment is combined with our ability to understand the environment, an ethic of accountability may be developed.

6 All species are of ecological, aesthetic, educational, historical, recreational and scientific value. They represent vital links in a complex web of relationships. When a species becomes extinct, this land and its unique qualities are lost forever. Also lost are irreplaceable genetic resources.

7 Appreciation for nature is an impetus for many forms of creative expression.

8 Man-made environments reflect and influence values, attitudes and life styles.

9 Cultural artifacts contribute to understanding historic and prehistoric people and other environments and offer evidence of past environmental conditions.

10 Prehistoric, historic and modern cultures are diverse partly because they evolved as adaptations to diverse natural environments.

11 We need the environment in more than material ways. It provides recreation and spiritual and creative inspiration.

12 A human settlement should be a place for the development of the human potential. There should be places to work, to learn, to relax and enjoy nature, to meet, to play, and to develop and express creativity.

13 Human settlements are a part of the environment. They are also environments in themselves. A good human settlement is a safe environment, not entirely removed from nature.

14 Wilderness is of intrinsic value, to be maintained for itself.

### **Goal C**

**Understands and values natural systems; comprehends that all life is connected and that before any part of an ecosystem is changed, the impact of the change on the ecosystem and the biosphere must be considered.**

#### Concepts

1 The survival of the human species depends on the environment and human interactions with it.

2 Human understanding of how this unique planet functions as a dynamic living system is incomplete.

3 An environment is continually shaped by human and nonhuman forces which alter conditions which can lead to changes in the type of organisms that can live there.

4 The natural world has intrinsic worth.

5 An environment is the complex of physical, chemical, biological and cultural factors affecting an individual population or community.

6 All living things are a product of their environment and an integral part of it, constantly interacting with it, affecting it and being affected by it.

7 Continuous change is a normal condition of environments and living things.

8 Humans are a part of nature, not separate from it.

9 Any organism or other component of an ecosystem can be fully understood only by studying it in relation to other components in the context of the system.

10 Plants and animals in an ecological system live in a dynamic web of interdependence.

- 11 Each species occupies a niche, playing a special ecological role in its community.
- 12 Living things interact in many ways including predation, competition and symbiotic relationships.
- 13 Physical factors such as energy, climate, geology, the water cycle and the sun impact ecological systems.
- 14 Food chains and energy transfer are vital processes within an ecosystem.
- 15 Toxic substances can move through food chains and tend to accumulate at higher concentrations in the upper trophic levels of ecosystems.
- 16 All plants and animals, including humans, require habitat for their existence.
- 17 The essentials of habitat, the basic needs of all living things including humans, are food, water, shelter and space in a usable arrangement.
- 18 Ecosystems have varying capacities for change and recovery.
- 19 Plant and animal species have evolved specific adaptations to their environment, including adaptations that are physical, biochemical and behavioral.
- 20 Extinction may occur when populations are unable to adapt to environmental change.
- 21 Topography, geology and landforms to a large extent determine the distribution of plant and animal life, as well as the usage of the land by humans.
- 22 Water is one of the most important requirements for life. However, more than 99 percent of the Earth's water is not readily available because it is saline (seawater) or frozen (icecaps and glaciers). Thus all life except marine life, depends on the remaining one percent.
- 23 Biogeochemical cycles are the movement of elements between the biotic and abiotic components of the biosphere. An example of a biogeochemical cycle is the cycling of carbon. It exists as carbon dioxide and as pure carbon in the abiotic state, and becomes part of an organic molecule when used by plants.
- 24 Nutrients are cycled and recycled through food chains from plants to herbivores to carnivores. Finally, decomposer organisms break down dead plants and animals and release their nutrients to the soil to be used again.
- 25 Life on the earth and the physical environment of the planet have evolved together and maintain each other. Life has evolved over billions of years from microscopic single-celled organisms to the wide variety of extant organisms including the human species.

26 A limiting factor is any factor of the environment which in excess (e.g. salinity in soils) or insufficient amounts (e.g., water in deserts) diminishes a population or inhibits the growth or reproduction of an individual organism.

27 Any given area has a carrying capacity, or a limit to the number of individuals it can support, for each species occurring there.

28 Cyclical changes in population size, within limits, are normal phenomenon for many species.

29 All populations have potential for exponential growth, but this is usually limited by available resources (space, food, water) physical factors (rainfall, temperature) and biological controls (competition, predation).

30 When a population increases beyond the carrying capacity of its habitat, the environment deteriorates and the population may decline sharply until a new equilibrium is reached.

31 The upper layer of the atmosphere contains ozone, a molecule of oxygen that screens out much of the sun's harmful ultraviolet radiation. Without ozone, life on earth probably could not have evolved to its present form. Certain chemicals released into the atmosphere are believed to be damaging the ozone layer.

32 The process of photosynthesis, past and present, has stored a limited supply of energy in fossil fuels and biological materials.

#### **Goal D**

**Thinks critically about environmental issues, communicates effectively about them, and is motivated to help resolve them.**

#### Concepts

1 Both action and inaction of individuals and groups affect the outcomes of environmental issues.

2 Today's media coverage greatly influences societal attitudes toward the environment.

3 Mass media can play a pivotal role in the spread of environmental awareness, disseminating information on environmental problems and possible solutions. Media can act as a catalyst, spurring concrete actions by government and non-government organizations, and by the public at large.

4 Each culture has a hierarchy of values which dictates how it uses the environment. These values may be environmentally sound, emphasizing use of those resources readily available.

5 Responsible decision-making involves research, consideration of values, creative evaluation of alternatives, a global orientation and a long-term perspective.

6 Conflict and political instability within and between nations often results from uneven distribution and control of resources.

7 Environmental policy is formed by the interaction of science and technology, social values, political factors, and aesthetic and economic considerations. Policies also arise from reactions to incidents (e.g., the Valdez Oil Spill), according to people's changing attitudes and perceptions, and in response to scientific investigations.

8 Decisions affecting the environment should be made only after considering possible consequences of each alternative. Cost-benefit analyses should incorporate environmental and human considerations as well as financial profit.

9 To formulate effective environmental policy, accurate information is crucial.

10 Change in the human environment is often so rapid that information and even some values learned in childhood may no longer be valid in adulthood. We must be willing to accept new information and adopt new values to live in harmony with our environment.

11 How the environment is affected by specific actions is a scientific question, but the choice of what action to take is a question of individual and societal values.

12 Western culture is primarily influenced by the Judeo-Christian ethic of viewing the environment primarily as a source of natural resources to be used for human benefit.

13 When technological advances exceed human comprehension of their effect on the environment, unanticipated environmental problems may develop.

14 Ethical decisions involve consideration of costs and benefits to self and others.

### **Goal E**

**Is committed to the continuing development and application of a sustainable land ethic.**

#### Concepts

1 Respect for land, water, air and all living things is important to the maintenance of a healthy environment.

2 Good citizenship involves understanding environmental issues, participating in public process and taking responsibility for personal life style choices.

Choosing life styles in harmony with the environment fosters long-term benefits to

present and future generations.

4 The availability of resources depends on current levels of technology and on human priorities (i.e., economic versus environmental concerns).

5 Effective ways to conserve both renewable and nonrenewable resources include reducing wasteful consumption and recycling materials whenever possible.

6 Sustained yield means managing forestry, agriculture or other resources so that they produce continuously, unimpaired by periodic harvests.

7 Good conservation practices combined with pollution control and land reclamation can help minimize the environmental disruption caused by using fossil fuels.

8 Our well-being is dependent on the environment. If we allow the quality of our environment to deteriorate, ultimately the quality of the human condition will also decline. This decline may be gradual or abrupt, perceived or unrecognized, permanent or repairable.

9 Developing an ethic of accountability toward the environment is essential for the continued health of the planet.

10 The values and ethics of individuals and societies are important factors in determining human behavior and societal impact on the environment.

11 Societies have developed many environmental belief systems based on tradition, folklore, economics, arts, language and science that shape their attitudes and use of their environment.

12 A healthy environment contributes to the economic well-being of ancient and modern, developed and undeveloped societies; conversely, environmental degradation causes the deterioration of natural life support systems and of societies dependent on those systems.

13 Establishing in our children a sense of their rich environmental heritage, which they must help to preserve, is more effective than just passing laws to protect resources.

14 Mining and quarrying activities cause significant damage to the land. Land reclamation, for example, by replacing the topsoil and replanting can help reduce long-term damage.

15 Renewable energy sources are those which can be replenished relatively rapidly. They take a variety of forms, including wind power, hydropower, solar energy, and energy from biological processes. Even these, however, can be exhausted when their rate of use exceeds their rate of replenishment.

16 Soil takes tens or hundreds of years to develop. Although traditionally taken for

granted as an infinite resource, soil must be considered a nonrenewable resource and conserved accordingly.

17 Renewable energy sources may cause less environmental disruption than non-renewable energy sources, (for example, solar collectors, which do not cause pollution). However, renewable energy sources can also damage the environment (e.g., large hydropower projects).

18 In many agriculturally advanced nations, gains in food production have come at the expense of topsoil (e.g., through excessive erosion and nutrient depletion). If this trend is not stabilized, or if soils are not occasionally revitalized by the planting of nitrogen-fixing species (such as legumes), even fertile soils will succumb to degradation in the long run.

19 Desertification can be ameliorated through afforestation and agroforestry, using suitable plant species, soil conservation techniques and watershed management.

### **Goal F**

**Will understand what natural resources management is, how and why humans manage natural resources and how this management affects all living things. Students will further understand that management decisions are based on human-defined goals, values and needs.**

### Concepts

1 Effective management of natural resources involves the application of scientific knowledge and technical skills to provide for the sustained use of these natural resources while protecting the quality of the environment.

2 Management practices can range from no activity to extensive intervention in ecological processes.

3 The development and enforcement of management policies and environmental laws are affected by economic factors, societal needs, ethics, politics, science and technology and public and private interests.

4 Conservation of natural resources (wise use and protection from waste depletion or pollution) is the most basic form of stewardship and the most immediate means of maintaining availability of resources.

5 Specific local, state and federal agencies are charged with management of natural resources and protection of environmental quality.

6 Private industry, organizations and individuals can influence resource management and environmental protection.

7 Because no nation is entirely self-sufficient in natural resources, the use and

management of resources need to be considered in a context of global human need.

8 Philosophies, objectives and practices of various types of resource management are sometimes incompatible with each other, and therefore compromises and trade-off may be necessary.

9 Management issues and environmental problems may arise when resource use is motivated by short-term goals and not tempered by evaluation of long-term consequences.

10 What determines a resource's economic value is its supply and demand in the context of the values, needs and wants of a society. The value of natural resource increases as availability of that resource decreases, or as demand for the resource increase.

11 Studying and understanding resources is vital to managing and protecting them for future use.

12 Groundwater is important as a perennial reservoir that regulates water supplies in streams, lakes and rivers and it must be protected from pollution.

13 To manage wildlife, it is necessary to manage the ecosystem. One species cannot be preserved in isolation; it depends and is depended upon by the other species with which it interacts.

14 Environment is an international concern. Atmospheric and ocean currents can carry pollutants to every part of the world, while over-harvesting of migratory species and changes in climate are problems that transcend national boundaries.