



CORRELATION CURRICULUM FRAMEWORKS

COURSE TITLE: Ecology

COURSE NUMBER: 2000380

SUBMISSION TITLE: Ecology: Concepts and Applications, Third Edition by Manual C. Molles © 2005

PUBLISHER: Glencoe/McGrawHill

A. Major Concepts/Content. The purpose of this course is to enable students to develop understanding of the natural relationships between organisms and other environmental factors.

The content should include, but not be limited to, the following:

- implementation of scientific habits of mind
- application of scientific knowledge, methodology, and historical context to solve problems
- use of laboratory technologies
- terminology
- biotic and abiotic environmental factors
- food chains and webs
- energy flow through ecosystems
- biogeochemical cycles
- population density and dispersal in an ecosystem
- major world biomes
- endangered species
- air, water, and land pollution
- impact of humankind on the environment
- ecosystem analysis
- field and laboratory techniques
- connections between ecology, technology, and society

This course shall integrate the Goal 3 Student Performance Standards of the Florida System of School Improvement and Accountability as appropriate to the content and processes of the subject matter.

Course student performance standards must be adopted by the district, and they must reflect appropriate Sunshine State Standards benchmarks.

B. Special Note. Laboratory investigations of selected topics in the content, which also include use of the scientific method, measurement, laboratory apparatus, and safety procedures, are an integral part of this course. Inquiry into current technology and applications of ecological principles and their relationship to the environment is encouraged.

C. Course Requirements. These requirements include, but are not limited to, the benchmarks from the Sunshine State Standards that are most relevant to this course. Benchmarks correlated with a specific course requirement may also be addressed by other course requirements as appropriate. Some requirements in this course are not addressed in the Sunshine State Standards.

Benchmarks from Science, Strand H, should not be taught and assessed in isolation, but should be combined with other benchmarks identified in this course description.

After successfully completing this course, the student will:

INTENDED OUTCOMES (Number and outcome)	PAGES(S) OR LOCATIONS(S) WHERE TAUGHT	I/M*
<p>1. Demonstrate effective implementation of scientific habits of mind.</p> <p>2. Apply knowledge of the nature of science, scientific methodology, and historical context to solve problems, and employ safe and effective use of laboratory technologies.</p> <p>SC.H.1.4.1 know that investigations are conducted to explore new phenomena, to check on previous results, to test how well a theory predicts, and to compare different theories.</p> <p>SC.H.1.4.2 know that from time to time, major shifts occur in the scientific view of how the world works, but that more often the changes that take place in the body of scientific knowledge are small modifications of prior knowledge.</p> <p>SC.H.1.4.3 understand that no matter how well one theory fits observations, a new theory might fit them as well or better, or might fit a wider range of observations, because in science, the testing, revising, and occasional discarding of theories, new and old, never ends and leads to an increasingly better understanding of how things work in the world, but not to absolute truth.</p> <p>SC.H.1.4.4 know that scientists in any one research group tend to see things alike and that therefore scientific teams are expected to seek out the possible sources of bias in the design of their investigations and in their data analysis.</p> <p>SC.H.1.4.5 understand that new ideas in science are</p>	<p>Throughout every chapter of the entire book 3-11</p> <p>6,8,11,108</p> <p>10,15,111</p> <p>235-236</p>	<p>M I</p> <p>M</p> <p>M</p> <p>M</p>

<p>limited by the context in which they are conceived, are often rejected by the scientific establishment, sometimes spring from unexpected findings, and usually grow slowly from many contributors.</p>	<p>4, 108</p>	<p>M</p>
<p>SC.H.1.4.6 understand that, in the short run, new ideas that do not mesh well with mainstream ideas in science often encounter vigorous criticism and that, in the long run, theories are judged by how they fit with other theories, the range of observations they explain, how well they explain observations, and how effective they are in predicting new findings.</p>	<p>564</p>	<p>M</p>
<p>SC.H.1.4.7 understand the importance of a sense of responsibility, a commitment to peer review, truthful reporting of the methods and outcomes of investigations, and making the public aware of the findings.</p>		
<p>SC.H.2.4.1 know that scientists assume that the universe is a vast system in which basic rules exist that may range from very simple to extremely complex, but that scientists operate on the belief that the rules can be discovered by careful, systemic study.</p>	<p>575</p>	<p>I</p>
<p>SC.H.2.4.2 know that scientists control conditions in order to obtain evidence, but when that is not possible for practical or ethical reasons, they try to observe a wide range of natural occurrences to discern patterns.</p>	<p>564</p>	<p>M</p>
<p>3. Demonstrate use of relevant terminology.</p>	<p>Throughout every chapter of the entire book 3-11</p>	<p>M I</p>
<p>4. Demonstrate understanding of biotic and abiotic environmental factors and their effects on various ecosystems.</p>		
<p>SC.G.1.4.1 know of the great diversity and interdependence of living things.</p>		
<p>SC.G.2.4.2 know that changes in a component of an ecosystem will have unpredictable effects on the entire system but that the components of the system tend to react in a way that will restore the ecosystem to its original condition.</p>	<p>This is a major theme throughout the text. 398-412, 419-435</p>	<p>M I</p>

<p>SC.G.2.4.4 know that the world ecosystems are shaped by physical factors that limit their productivity.</p>	<p>485-507</p>	<p>I</p>
<p>5. Demonstrate use of food chains and webs to show relationships among living things in the environment.</p>	<p>227-233, 516-522</p>	<p>I</p>
<p>6. Trace the pathway of energy through various ecosystems.</p>	<p>419-438</p>	<p>I</p>
<p>SC.B.1.4.1 understand how knowledge of energy is fundamental to all the scientific disciplines (e.g., the energy required for biological processes in living organisms and the energy required for the building, erosion, and rebuilding of the Earth).</p>		
<p>SC.B.1.4.2 understand that there is conservation of mass and energy when matter is transformed.</p>		
<p>SC.B.1.4.6 know that the first law of thermodynamics relates the transfer of energy to the work done and the heat transferred.</p>		
<p>SC.B.1.4.7 know that the total amount of usable energy always decreases, even though the total amount of energy is conserved in any transfer.</p>		
<p>SC.G.1.4.2 understand how the flow of energy through an ecosystem made up of producers, consumers, and decomposers carries out the processes of life and that some energy dissipates as heat and is not recycled.</p>		
<p>7. Trace the pathways of various biogeochemical cycles (e.g., water, phosphorous, calcium, carbon, oxygen, nitrogen) as they relate to environments in Florida.</p>	<p>442, 453-456</p>	<p>I</p>
<p>8. Define a population and demonstrate knowledge of the</p>		

<p>factors that determine its density and dispersal in an ecosystem.</p>	<p>53-54, 463-466</p>	<p>I</p>
<p>SC.F.2.4.3 understand the mechanisms of change (e.g., mutation and natural selection) that lead to adaptations in a species and their ability to survive naturally in changing conditions and to increase species diversity.</p>		
<p>SC.G.2.4.3 understand how genetic variation of offspring contributes to population control in an environment and that natural selection ensures that those who are best adapted to their surroundings survive to reproduce.</p>	<p>198-250</p>	<p>I</p>
<p>9. Demonstrate knowledge of major biomes of the world, including their climate, flora, fauna, and location.</p>	<p>198-205, 209-215, 216-218</p>	<p>I</p>
<p>SC.D.1.4.1 know how climatic patterns on Earth result from an interplay of many factors (Earth's topography, its rotation on its axis, solar radiation, the transfer of heat energy where the atmosphere interfaces with lands and oceans, and wind and ocean currents).</p>	<p>198-205, 209-215, 216-218</p>	<p>I</p>
<p>SC.D.1.4.3 know that changes in Earth's climate, geological activity, and life forms may be traced and compared.</p>		
<p>10. Demonstrate awareness of endangered species in Florida, the nation, and the world and the factors that cause endangerment.</p>	<p>17-21 48-49, 57</p>	<p>I M</p>
<p>11. Demonstrate knowledge of major causes of air, water, and land pollution.</p>	<p>47-48</p>	<p>I</p>
<p>12. Demonstrate knowledge of the impact of humankind on the global environment over time.</p>		
<p>SC.G.2.4.5 understand that the amount of life any environment can support is limited and that human activities can change the flow of energy and reduce the fertility of the Earth.</p>	<p>247</p>	<p>M</p>

<p>SC.G.2.4.6 know the ways in which humans today are placing their environmental support systems at risk (e.g., rapid human population growth, environmental degradation, and resource depletion).</p>	<p>44, 59, 72, 81-82 576-579</p>	<p>I</p>
<p>13. Analyze a local ecosystem qualitatively and quantitatively using field and laboratory techniques.</p>	<p>27-28, 30, 32-33, 35-37, 41, 44-47, 64, 68, 72, 78, 81-82, 317-319, 479-481, 569-573, 576-579</p>	<p>I</p>
<p>14. Demonstrate understanding of the connections of ecology with technology and society.</p>	<p>27-28, 30, 32-33, 35-37, 41, 44-47, 64, 68, 72, 78, 81-82, 317-319, 479-481, 569-573, 576-579</p>	<p>I</p>
<p>SC.B.1.4.5 know that each source of energy presents advantages and disadvantages to its use in society (e.g., political and economic implications may determine a society's selection of renewable or nonrenewable energy sources).</p>		
<p>SC.D.2.4.1 understand the interconnectedness of the systems on Earth and the quality of life.</p>		
<p>SC.H.3.4.1 know that performance testing is often conducted using small-scale models, computer simulations, or analogous systems to reduce the chance of system failure.</p>		
<p>SC.H.3.4.2 know that technological problems often create a demand for new scientific knowledge and that new technologies make it possible for scientists to extend their research in a way that advances science.</p>		
<p>SC.H.3.4.3 know that scientists can bring information, insights, and analytical skills to matters of public concern and help people understand the possible causes and effects of events.</p>	<p>163, 330-334, 360-364</p>	<p>I</p>
<p>SC.H.3.4.4 know that funds for science research come from federal government agencies, industry, and private foundations and that this funding often influences the areas of discovery.</p>	<p>83-85, 139-141, 201-202, 219-222, 554-556 92, 99</p>	<p>I M</p>
<p>SC.H.3.4.5 know that the value of a technology may differ for different people and at different times.</p>	<p>15, 317-319, 369-371, 530-533, 579-580</p>	<p>I</p>

<p>SC.H.3.4.6 know that scientific knowledge is used by those who engage in design and technology to solve practical problems, taking human values and limitations into account.</p>	<p>83-85, 164-166, 317-319, 579-580</p>	<p>I</p>
---	--	-----------------

I = Taught In Depth

M = Mentioned Only