



Southern Lehigh School District

High School Syllabus

Ecology 2013-2014

Course Description:

This course examines the environment and man's impact on it. The students will develop an understanding of what an ecosystem is and the elements that determine the types and numbers of organisms that live there. We will look at the atmosphere (air), the hydrosphere (water) and the lithosphere (soil) and how they sustain the biosphere (life). We will also look at the role humans have had in changing each of these spheres and the impact these changes have had on the world. The students will be asked to define different problems facing the world today. They will research the problem and propose possible solutions and potential obstacles to the implementation of these solutions. These activities and projects will be oriented towards collecting data, analyzing the information and drawing conclusions that are supported by the data to create their solutions.

Course Content:

I. Ecosystems

- Biotic and abiotic factors
- Limiting factors
- Carrying capacity
- Feeding relationships and niche
- Energy transfer and flow
- Biogeochemical cycles
- Biomes and their defining characteristics
- Evolution
- Introduced species and endangered species

II. Atmosphere

- Composition, structure and phenomena
- Human impact
- Major international initiatives
- Global Warming and carbon dioxide concentration relationship
- Pollution

III. Lithosphere

- Composition, structure and classification
- Human impact
- Pollution and remediation

IV. Hydrosphere

- Classification and availability
- Human impact
- Pollution and remediation

V. Human Population

- Historical, current and future trends
- Potential problems
- Demographics of different countries

Required Textbooks and/or Other Reading/Research Materials

The textbook will be supplemented with internet sources and additional information and readings.

Environmental Science: How the World Works and Your Place in it. J.M. LeBel Enterprises © 1995.

Course Requirements:

Each student is required to complete all projects, tests and assignments. Failure to do so will affect the student's overall grade. While access to the internet is not necessary, it would allow the student to do research at home and assist in completing their projects.

Grade Components/Assessments:

Grades are based on a point system that is converted into an overall percentage. The following categories will be used to assess the student's performance and provide feedback as to their individual strengths and weaknesses.

Tests and Quizzes: 20% of the grade
Laboratory activities: 30% of the grade
Projects: 30% of the grade
In-class activities: 15% of the grade
Homework: 5% of the grade

Since the emphasis of the class is on the evaluation and application of information to everyday problems, the majority of the grade for this class will come from laboratory activities and research projects. Students will work individually and in groups for the various activities and each activity will have a group and individual grade component in their assessment.

Alternative Assessments:

The following is a list of projects that have been completed in the past. All or some of these projects may be completed in the upcoming year.

Biome brochure – The students will research and create a brochure that advertises for a particular biome. The activity includes the creation of a brochure and a presentation of the important information to the class.

Endangered species project – The students will research and present information on selected endangered species found in Pennsylvania.

Introduced/invasive species brochure – The students will create a brochure that presents information on invasive species that details identification of the species and measures that can be used to prevent the spread of this species.

Plant or insect collection – The students will collect representative species for preservation and identification. Proper techniques in identification and labeling will be used.

Debate – The students will choose an environmental topic that they will research and debate with other members of the class.

Carbon dioxide analysis lab – The students will use data collect form a number of sites around the world to determine if there has been an increase in the level of CO₂ and what that information means to the health of the planet.

Ecoplot field study – The students will choose a meter square plot to observe for a six-week period. They will note the changes that occur and attempt to correlate the information with weather data.

Final video/research project – The students will complete a research project on a topic of their choice. They will be responsible for creating a presentation that is appropriate for a particular audience.

Tree field study – The students will collect data from a homogenous population and attempt to determine the factors that have contributed to the differences between individuals within the population.

Each marking period is worth 20% of a student's overall grade. The midterm and final exam are each worth 10% of a student's overall average:

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| Quarter 1 | 20% |
| Quarter 2 | 20% |
| Midterm | 10% |
| Quarter 3 | 20% |
| Quarter 4 | 20% |
| Final | 10% |

Required Summer Reading/Assignments:

No required summer reading