Maine Envirothon- Much More than a Competition…

(A complete educational program supporting Learning Results, Cooperative Learning, Authentic Assessment, and Community Involvement)

In most schools in Maine, Envirothon has been used as an after school club or as an academic team. However, you may want to consider how Envirothon could be integrated more deeply as part of your classroom curriculum. Here are several suggestions of how to use Envirothon materials in your classroom, as well as a listing of Learning Results, Guiding Principles, and other educational goals that Envirothon develops:

- Teach Envirothon concepts in your classroom to enhance the development of key Learning Results and Guiding principles. This need not be limited to Science classes, as many of the materials, particularly the current issue and presentation problem focus on analyzing local issues and seeking solutions to community problems, research skills, and presentation skills.

- Utilize the current issue problem as an annual class-wide research project where students work together in small groups. This develops research skills, collaborative learning, writing and presentation skills, problem solving skills, as well as touching on may content standards. You might even want to collaborate with another teacher. (ie. social studies, government or writing) You could use the same judging rubric developed by Maine Envirothon to evaluate the results in a complete example of authentic assessment.

- Use the Envirothon current issue and other analysis as a jumping off point to get your students involved in community service or service learning projects.

- Have your students get involved mentoring middle school or elementary students in activities related to Envirothon. South Portland High School teams have helped organize a Junior Envirothon in their area for a number of years.

- Some schools are using Envirothon as the basis for an environmental studies course or seminar. You could even run a mini-Envirothon in your class and send the top ranking teams to the regional competition.

- The possibilities are limitless. Look below on some of the diverse skills Envirothon promotes. These are just a few suggestions, we would love to here about some other ways you have utilized or would like to implement in your classroom using Envirothon.

We urge you to look closely at Maine Envirothon and you will find that it covers a lot of educational ground in the form of an exciting educational program that students enjoy and gain a great deal from.

- Touches on virtually every aspect of curriculum in an interdisciplinary manner fostering hands-on problem-solving and looking at the environmental, economic, and social aspects of environmental issues.

- Develops a broad base knowledge of natural resource concepts which are applied in an integrated and hands-on manner, especially in the areas of soils, water, wildlife, forestry and environmental current issues.

- Promotes collaborative skills through a team work approach

- Appeals to a wide range of students with a variety of learning styles. The Envirothon program requires teams to use a wide range of skills, including cognitive knowledge in a wide range of disciplines, hands-on analysis skills, teamwork skills, research skills, oral and visual presentation skills. Canon Envirothon is one of the few North American competitions that maintains a nearly even mix of girls and boys.

- Promotes community involvement through examining first-hand community issues and promotes community service. For example in 2001 students studied water pollution problems of their own school and community and several made recommendations to their local school.

- Provides authentic assessment through the competition and the current issue project. These tools could also be used with your complete class. (After the competition this year one student turned to their teacher and said, "After this competition we will not need a final exam because this test covers much more than any final could cover.") We also have developed clear, objective rubrics for the assessment of the student's presentations.

- Envirothon packages its learning in a fun, challenging format that appeals to students while encouraging them to develop skills, and delve deeper into environmental issues that affect their lives and their community.

- Envirothon develops career awareness and skills. Many students have used this program as a stepping off point to enter environmental careers. Maine Envirothon has a scholarship program through the University of Maine, and the students interact with resource professionals in many aspects of the program.

Participation in Envirothon helps high school students attain the following guiding principles and standards of the State of Maine Learning Results:

Excerpt from the State of Maine Learning Results - Maine Dept. of Education

Guiding Principles

Each Maine student must leave school as:

1. ***A CLEAR AND EFFECTIVE COMMUNICATOR***

   Envirothon teams have to make clear oral and visual presentations for the current issue. The questions on the tests often involve open-ended responses.

2. ***A SELF-DIRECTED AND LIFE-LONG LEARNER***

   Students need to work independently to collect information needed to understand the environment concepts and issues covered by Envirothon. The learning is focused on their local community and resources which go far beyond the walls of the school, and school hours.

3. ***A CREATIVE AND PRACTICAL PROBLEM SOLVER***

   Envirothon teams need to come up with solutions to real-life problems. The solutions proposed are encouraged to be creative but must be practical environmentally, economically, and socially.

4. ***A RESPONSIBLE AND INVOLVED CITIZEN***

   Envirothon develops awareness of community issues and challenges students to get involved in their community through research, application of knowledge, and by devising actions that could improve local conditions.

5. ***A COLLABORATIVE AND QUALITY WORKER***

   Students involved with Envirothon work together in teams. They must find ways to balance each other's strengths and weaknesses to produce a quality understanding of environmental issues. The current issue presentation problem focuses the students on a tangible product that is assessed with a comprehensive rubric.

6. ***AN INTEGRATIVE AND INFORMED THINKER***

   Students must integrate their knowledge of a wide range of topics to analyze and develop solutions to environmental issues. The students are presented with a wide range of information that they must apply to complex, interconnected environmental issues.

Content Standards addressed by Maine Envirothon:

Science and Technology

Envirothon students develop a great deal of hands-on scientific knowledge that is applied to current environmental issues.

A. CLASSIFYING LIFE FORMS

Students will understand that there are similarities within the diversity of all living things

2. Describe similarities and differences among organisms within each level of the taxonomic system for classifying organisms (kingdom through species).

3. Analyze the basic characteristics of living things, including their need for food, water, and gases and the ability to reproduce.

B. ECOLOGY

Students will understand how living things depend on one another and on non-living aspects of the environment.

1. Illustrate the cycles of matter in the environment and explain their interrelationships.

3. Analyze the factors that affect population size (e.g., reproductive and survival rates).

4. Analyze the impact of human and other activities on the type and pace of change in ecosystems.

D. CONTINUITY AND CHANGE

Students will understand the basis for all life and that all living things change over time.

3. Explain and document the importance of relatively shortterm changes (e.g., one generation) on a species' survival.

J. INQUIRY AND PROBLEM SOLVING

Students will apply inquiry and problem-solving approaches in science and technology.

1. Make accurate observations using appropriate tools and units of measure.

2. Verify, evaluate, and use results in a purposeful way. This includes analyzing and interpreting data, making predictions based on observed patterns, testing solutions against the original problem conditions, and formulating additional questions.

3. Demonstrate the ability to use scientific inquiry and technological method with short term and long term investigations, recognizing that there is more than one way to solve a problem. Demonstrate knowledge of when to try different strategies.

K. SCIENTIFIC REASONING

Students will learn to formulate and justify ideas and to make informed decisions.

1. Judge the accuracy of alternative explanations by identifying the evidence necessary to support them.

2. Explain why agreement among people does not make an argument valid.

3. Develop generalizations based on observations.

4. Determine when there is a need to revise studies in order to improve their validity through better sampling, controls or data analysis techniques.

5. Produce inductive and deductive arguments to support conjecture.

6. Analyze situations where more than one logical conclusion can be drawn.

L. COMMUNICATION

Students will communicate effectively in the applications of science and technology.

1. Analyze research or other literature for accuracy in the design and findings of experiments.

2. Use journals and self-assessment to describe and analyze scientific and technological experiences and to reflect on problem-solving processes.

3. Make and use appropriate symbols, pictures, diagrams, scale drawings, and models to represent and simplify real-life situations and to solve problems.

4. Employ graphs, tables, and maps in making arguments and drawing conclusions.

5. Critique models, stating how they do and do not effectively represent the real phenomenon.

6. Evaluate the communication capabilities of new kinds of media (e.g., cameras with computer disks instead of film).

7. Use computers to organize data, generate models, and do research for problem solving.

8. Engage in a debate, on a scientific issue, where both points of view are based on the same set of information.

M. IMPLICATIONS OF SCIENCE AND TECHNOLOGY

Students will understand the historical, social, economic, environmental, and ethical implications of science and technology.

1. Examine the impact of political decisions on science and technology.

2. Demonstrate the importance of resource management, controlling environmental impacts, and maintaining natural ecosystems.

3. Evaluate the ethical use or introduction of new scientific or technological developments.

4. Analyze the impacts of various scientific and technological developments.

5. Examine the historical relationships between prevailing cultural beliefs and breakthroughs in science and technology.

6. Research issues that illustrate the effects of technological imbalances and suggest some solutions

Social Studies

Envirothon students are involved with understanding how societies and government agencies make decisions. Students are exposed to environmental agencies, the impact of regulations, and developing solutions to environmental issues that balance environmental, economic and social concerns. In addition, the teams are involved with a great deal of map work and understanding the historical background of environmental issues.

CIVICS AND GOVERNMENT

A. RIGHTS, RESPONSIBILITIES, AND PARTICIPATION

Students will understand the rights and responsibilities of civic life and employ the skills of effective civic participation.

2. Assess the different jurisdictions and roles of local, state, and federal governments in relation to an important public policy issue.

HISTORY

C. HISTORICAL INQUIRY, ANALYSIS, AND INTERPRETATION

Students will learn to evaluate resource material such as documents, artifacts, maps, artworks, and literature, and to make judgments about the perspectives of the authors and their credibility when interpreting current historical events.

1.Evaluate and use historical materials to formulate historical hypotheses regarding a specific issue (e.g., space travel), and to make predictions about the future of the issue.

2. Examine and analyze primary and secondary sources in order to differentiate between historical facts and historical interpretations, and to support or reject historical hypotheses.

4. Compare and contrast the reliability of information received from multiple sources (e.g., newspapers, radio or TV, biography, historical narrative) to assess an historical issue.

GEOGRAPHY

A. SKILLS AND TOOLS

Students will know how to construct and interpret maps and use globes and other geographic tools to locate and derive information about people, places, regions, and environments.

1. Use mapping to answer complex geographic and environmental problems.

2. Appraise the ways in which maps reflect economic, social, and political policy decision making.

B. HUMAN INTERACTION WITH ENVIRONMENTS

Students will understand and analyze the relationships among people and their physical environments.

1. Explain factors which shape places and regions over time (e.g., physical and cultural factors).

ECONOMICS

A. PERSONAL AND CONSUMER ECONOMICS

Students will understand that economic decisions are based on the availability of resources and the costs and benefits of choices.

1. Conduct a cost benefit analysis of a personal or business decision.

Career Preparation:

Envirothon students approach environmental issues from the perspective of a natural resource professional and are exposed to many professionals and professional skills.

A. PREPARING FOR THE FUTURE

Students will be knowledgeable about the world of work, explore career options, and relate personal skills, aptitudes, and abilities to future career decisions.

1. Demonstrate the leadership and membership skills necessary to succeed as a member of a team.

2. Analyze skills and abilities required in a variety of career options and relate them to their own skills and abilities.

3. Demonstrate an understanding of the relationship between the changing nature of work and educational requirements.

C. INTEGRATED AND APPLIED LEARNING

Students will demonstrate how academic knowledge and skills are applied in the workplace and other settings.

1. Demonstrate an understanding of the integration and application of academic and occupational skills in school learning, work, and personal lives.

4. Use mathematical, scientific, and technological tools to design and apply solutions to a community problem.

D. BALANCING RESPONSIBILITIES

Students will acquire and apply skills/concepts required to balance personal, family, community, and work responsibilities. (The task of developing an effective Envirothon team involves balancing many of the student's real-life responsibilities.)

3. Demonstrate an understanding of the importance of community involvement to family and community life.

English Language Arts

Envirothon students must process a great deal of resource materials, develop a coherent oral and visual presentation to effectively express their understanding and solution to a current environmental issue.

A. PROCESS OF READING

Students will use the skills and strategies of the reading process to comprehend, interpret, evaluate, and appreciate what they have read.

3. Identify the author's purpose and analyze the effects of that purpose on the text.

4. Identify the author's point of view and analyze the effects of that point of view on the text.

8. Find the meaning of relatively uncommon technical terms used in informational texts.

D. INFORMATIONAL TEXTS

Students will apply reading, listening, and viewing strategies to informational texts across all areas of curriculum.

1. Scan a passage to determine whether a text contains relevant information.

2. Distinguish between apparent fact and opinion in nonfiction texts.

3. Use discussions with peers as a way of understanding information.

4. Identify complex structures in informational texts and the relationships between the concepts and details in those structures using texts from various disciplines.

5. Analyze and synthesize the concepts and details in informational texts.

6. Explain how new information from a text changes personal knowledge.

E. PROCESSES OF WRITING AND SPEAKING

Students will demonstrate the ability to use the skills and strategies of the writing process.

2. Reflect on, evaluate, revise, and edit a sequence of drafts to improve and polish finished work.

3. Use planning, drafting, and revising to produce, on demand, a well-developed, organized piece that demonstrates effective language use, voice, and command of mechanics.

4. Evaluate the remarks and oral presentations of others to find the key ideas, and explain the ways in which these ideas were developed.

G. STYLISTIC AND RHETORICAL ASPECTS OF WRITING AND SPEAKING

Students will use stylistic and rhetorical aspects of writing and speaking to explore ideas, to present lines of thought, to represent and reflect on human experience, and to communicate feelings, knowledge, and opinions.

1. Write stories that effectively develop such elements as setting, major events, problems and solutions.

5. Write pieces and deliver oral presentations that achieve distinct purposes (e.g., to persuade, evaluate, analyze, defend).

7. Write pieces and deliver oral presentations in which the organization of the work follows from the purpose.

9. Write essays and deliver oral presentations that reliably support and provide details for the explicitly stated generalizations.

11. Make effective use of a variety of techniques for introducing and representing ideas and insights in written work and oral presentations

H. RESEARCH-RELATED WRITING AND SPEAKING

Students will work, write, and speak effectively in connection with research in all content areas.

1. Develop an appropriate strategy for finding information on a particular topic.
2. Use reference materials while doing research.
3. Record significant information from events attended and interviews conducted.
4. Identify and use library information services.
5. Use government publications, in-depth field studies, and almanacs for research.
6. Use CD-ROM, microfiche, and similar resource media for research.
7. Identify and use a variety of news sources (e.g., newspapers, magazines, broadcast and recorded media, artifacts), informants, and other likely sources for research purposes.
8. Use search engines and other Internet resources to do research.
9. Make extensive use of primary sources when researching a topic and carefully evaluate the motives and perspectives of the authors.
10. Analyze the validity and weigh the reliability of primary information sources and make appropriate use of such information for research purposes.
11. Evaluate information for accuracy, currency, and possible bias.
12. Report orally, using a variety of technological resources to present the results of a research project.

HEALTH AND PHYSICAL EDUCATION:

Envirothon students evaluate the relationship between the connection between environmental problems and human health. In addition Envirothon students are often involved in outdoor activities such as hiking, and canoeing to pursue their hands-on study of the environment and the management of natural resources.

C. HEALTH PROMOTION AND RISK REDUCTION

Students will understand how to reduce their health risks through the practice of healthy behaviors.

1. Analyze the extent to which individuals are responsible for enhancing health and safety in the community and the workplace.

F. DECISION-MAKING AND GOAL SETTING

Students will learn how to set personal goals and make decisions that lead to better health.

2. Analyze health concerns that require collaborative decision making.
3. Predict the immediate and long-term impact of health decisions on the individual, family, and community.

Mathematics

Envirothon students often apply math skills to analyze environmental issues: making measurements, computing results, developing and analyzing numerical data, and interpreting data.

C. DATA ANALYSIS AND STATISTICS

Students will understand and apply concepts of data analysis.

1. Determine and evaluate the effect of variables on the results of data collection.

2. Predict and draw conclusions from charts, tables, and graphs that summarize data from practical situations.

F. MEASUREMENT

Students will understand and demonstrate measurement skills..

1. Use measurement tools and units appropriately and recognize limitations in the precision of the measurement tools.

2. Derive and use formulas for area, surface area, and volume of many types of figures.

G. PATTERNS, RELATIONS, FUNCTIONS

Students will understand that mathematics is the science of patterns, relationships, and functions. Students will be able to:

1. Create a graph to represent a real-life situation and draw inferences from it.

2. Translate and solve a real-life problem using symbolic language.

Visual and Performing Arts

Envirothon teams develop visuals to illustrate their understanding of environmental concepts and the solution they developed for the current environmental issue.

- **A. CREATIVE EXPRESSION. Students will create and/or perform to express ideas and feelings**.

1. Create a visual or performance piece to communicate an idea, feeling, or meaning using:
    - a distinct style;
    - imagination and technical skill; and
    - the creative process, reflection, and self-evaluation (problem-solving skills).