HOW TO USE THIS MODULE

The AMBIENT curriculum food module is comprised of a number of segments. Some of these segments can be taught independently and others are meant to be used together in a certain order. The segments are presented roughly in order of planned presentation although it is noted when a segment can be skipped or used out of order. Each segment begins with a cover sheet for teachers describing its;

- Purpose
- Time required
- Required skills
- Key concepts
- Materials needed
- Assessment techniques

The following is a description of the segments and instructions on how teachers can use them to best suit their interests and the time they have allotted to the module.

NOTE: It is recommended that teachers alternate lecture format lessons with the lab-oriented segments to maintain student interest.

“Ethics Enigma”

The AMBIENT curriculum features shaded areas accompanied by the “Ethics Enigma” [put character here] in some of its exercises, which highlight ethical issues for teachers. These topics come in two forms:

1) A “Classroom Concern” – These are practical issues teachers may face when doing a given lesson. The ethics box points out pitfalls to avoid when carrying out an exercise.

2) A “Big Idea” – These highlight the larger ethical questions that face society as a whole, or particular segments of society as part of dealing with given environmental health issues. These include concepts of responsibility, harm, fairness and compensation. These boxes can serve as discussion starters during the work of the exercise.
Student Segments

I. Food Scenario: Cruise Ship Banquet

Scenario -- This is the core of the unit and is comprised of several exercises that develop the concept of the class as a group of public health consultants investigating foodborne illness, as well as environmental inspections and nutritional issues of food and food preparation.

a. Introduction Menu Exercise - this activity introduces key concepts of the module, particularly food has both a potential hazard and benefit, by having students order from a menu and suffer from food poisoning as a role play. The menu is then analyzed for possible sources of food poisoning as well as for its nutritional content.

b. Video – this video contains actual news clips of foodborne illness outbreaks on cruise ships in Miami.

c. Food/Foodborne Illness Scenario – in this activity, the students are members of a Public Health Consultant Team on call to the cruise line company to deal with an outbreak of food poisoning on a cruise ship. The students will provide advice and expertise on how to isolate the problem and prevent it from happening again. The students will report their entire discovery process and recommendations to the Cruise Line board.

d. Banquet Menu Assessment: Exposure Investigation Exercise – students are given copies of the menus from the cruise ship and asked to analyze these food contents from the point of view of sources of risk for foodborne illness and the nutritional content of the foods.

e. Food Journal – to explore further the issue of nutrition and food, this exercise will require students to record everything they eat and drink for 1 consecutive day. This will enable students to evaluate the nutrient composition of their diet, as well as their dietary pattern and behavior within the context of current dietary recommendations.

f. Looking At Food Labels – to explore further the issue of nutrition and food, students are asked to interpret and understand the food and nutrition on food labels, and to determine their nutrient needs and how understanding food labels can help them to meet those needs.

g. Kitchen Inspection / HACCP - Students are asked to use a Dept of Health Inspection Form to evaluate a kitchen/food preparation facility as individuals or in teams (this could be school facility, restaurant or even their own homes). In addition, students are asked to research prevention of food borne illness during food storage and food preparation including the Hazard Analysis and Critical Control Point System (HACCP) concepts.

h. Food safety Labs – Appropriate temperature control, prevention of cross contamination and hygienic food preparation techniques are key concepts in preventing foodborne illness. Students will simulate how high temperatures affect bacterial growth using yeast cultures and how low temperatures affect food preservation. In addition, they will simulate cross contamination of bacteria and the effects of poor hygiene on bacterial growth.

i. Health Effects Investigation – This exercise intends to demonstrate how epidemiological investigations of outbreaks are performed. Participation in this case study illustrates the principles of hypothesis formation and testing by epidemiologic study in the setting of an acute
foodborne disease outbreak. The potential to answer important scientific questions about the cases and non-cases and their food histories in the scenario outbreak will be emphasized.

II. GIS Remote Sensing Lab for Harmful Algal Blooms – this exercise will use actual Florida Marine Research Institute (FMRI) satellite images to learn basic principals of Geographic information Systems (GIS) and to explore the concept of environmental health, specifically in regard to geographic analysis, hypothesis development, experiment design, and public health decision making.

III. Dinoflagellate Labs
Dinoflagellates are phytoplankton at the base of the marine food web. These organisms can produce potent natural toxins that can accumulate and concentrate in higher organisms, and cause foodborne illness. Humans can be exposed to these dinoflagellate toxins when they consume contaminated seafood resulting in a wide range of both acute and chronic health effects in humans and other species. The following are a series of laboratory activities on various scientific issues of these fascinating organisms.

a. Spectroscopy Chlorophyll Lab: Obtain Visible Spectra Of Chlorophyll A - This exercise is designed to familiarize the student with the concept of spectroscopy or the study of the interaction of matter with electromagnetic radiation. Students will prepare solutions and measure absorbance at different wavelengths. They will measure and graph the absorbance of light by chlorophyll at different wavelengths within the visible spectrum. Different versions of this laboratory activity are available depending on the availability of equipment.

b. Spectroscopy Chlorophyll Lab: Generate a Calibration Curve for Chlorophyll a - This exercise is designed to familiarize the student with the concept of spectroscopy or the study of the interaction of matter with electromagnetic radiation. Students will prepare solutions and use a spectrophotometer to measure absorbance by solutions of different concentrations. Students will measure and graph the absorbance of light by chlorophyll at a specific wavelength (the absorbance maximum) versus chlorophyll concentration. Students will be given an unknown and determine its concentration from their calibration curve.

c. Chromatography Of Photosynthetic Pigments - This exercise is designed to introduce the student to the technique of chromatography, a highly useful technique used by chemists to separate a mixture of compounds. Students will visualize photosynthetic pigments and will realize that different organisms have different pigments that perform the same function. Students will analyze and compare photosynthetic pigments from two different organisms.

d. Bioluminescence Lab – This experiment introduces the students to chemical reactions, reaction rates, chemiluminescence, fluorescence, and bioluminescence. Students stimulate and observe the phenomena of bioluminescence, fluorescence and chemiluminescence using bioluminescent dinoflagellates.

IV. Creative Writing
a. Family Recipes And Family Meals - Students will explore the connections between food and culture by investigating the cultural influences, preparation, and historical ties of the food that people eat. They will also be able to gain an understanding of how geography and climate effects what people eat culturally. Students will examine how different types of foods that they grew up with (or any cultural/ethnic recipe) may be helpful or harmful, investigate the history of these foods in their culture, and create their own story or write about a food or recipe they know.
b. Ethnobotany Research Project - Ethnobotany is the study of how people of a particular culture and region make use of indigenous plants. Ethnobotanists explore how plants are used for such things as food, shelter, medicine, clothing, hunting, and religious ceremonies. Ethnobotany has its roots in botany, the study of plants. This section will require students to investigate different sources (ie books, journals, video, internet) for constructing a presentable written and oral report.

V. Ethical and Critical Reading /Thinking

a. Food Myths “What’s cooking” – Food myths and beliefs differ based on various factors including culture, ethnicity, social, economic and nutritional factors. This activity requires students to read a series of statements made by students about the hazards and benefits of various foods. The students are required to distinguish the “facts” from “opinions” in the dialogue and write an essay expressing their own views and conclusions about the food, foodborne illness, and nutrition issues.

b. Genetically Modified Food - To critically read different points of view concerning Genetically Modified Food, students will research the issue of Genetically Modified Food and develop their own opinion about this issue supported by the research. This section will require students to read statements representing different points of view on Genetically Modified Food, identify the “facts” and “opinions” in each statement, and then briefly summarize the issue of Genetically Modified Food in a short paragraph. Finally, the student must research and create an essay expressing their own opinion about Genetically Modified Food, using citations from these statements and other sources to support their conclusions. This activity can be used as preparation for the Genetically Modified Food Debate as a culminating activity for this module.

VI. Culminating Experience:

a. Educational Outreach Package – To integrate all the knowledge from the AMBIENT Food Module, students will develop educational materials targeted at a specific population concerning important facts and prevention of a particular foodborne illness. This section will require students to work in teams to research and create educational material succinctly summarizing known salient facts, including prevention, of a particular foodborne disease. The educational materials must be presented in both oral and written format, and targeted at an identified population.

b. Genetically Modified Food Debate –To integrate all the knowledge from the AMBIENT Food Module by creating a presentation taking a particular ethical stance or point of view which is researched and substantiated. Students will be asked to work in teams to develop a presentation and handout representing a particular point of view in Genetically Modified Food Debate. This experience will require the students to synthesize their varied knowledge of food, food contamination, nutrition, and their issues, organize this knowledge, and present it persuasively to their peers.