RISK MANAGEMENT

LEVEL:

Grades 9-12. This lesson builds conceptual understanding, scientific investigation and practical reasoning while developing and using reading, writing, and mathematics.

PURPOSE:

The purpose is to investigate risk management, in order to prepare students to analyze risks and make informed choices based on their analyses.

CONTENT:

This unit covers Science Standards Unifying Concepts and Processes, Science as Inquiry, Science in Personal and Social Perspectives.

SCIENCE CONCEPTS:

Systems, order and organization, Evidence, models, and explanations, Change, constancy, and measurement, Abilities necessary to do scientific inquiry, Understandings about scientific inquiry, Personal and community health, Environmental quality, Natural and human-induced hazards, Science and technology in local, national, and global challenges.

OVERVIEW:

This lesson focuses on risk management using four learning activities regarding case studies, interviews, prioritizing, and modeling. The learning activities will take from 4 to 12 class periods. Each activity has a performance task that assesses the applied skills in individual or group ways. All tasks and assessments may be scored by rubrics for diagnostics and reporting. (See Graphic Organizers-Teachers in Teacher Resource Center.)

INTRODUCTION:

Preview the lessons on Risk Management by introducing the skills and concepts to be learned and how these skills will be used in the lesson activities. Concepts/terms we will encounter as we learn about risk management are risk management, hazardous chemicals, exposure assessment.

BASIC SKILLS APPLIED IN THIS LESSON

MATHEMATICS SKILLS	ACT 1	ACT 2	ACT 3	ACT 4
statistics			X	
use language to achieve mathematical meaning			X	X
use modeling to achieve mathematical meaning				X
use graphing to achieve mathematical meaning				X
use numbers to achieve mathematical meaning			X	X
use curve fitting to predict from data				X
operate on expressions and matrices, and solve equations and inequalities			X	
model real-world phenomena with a variety of functions				X
represent and analyze relationships using tables, verbal rules, equations, and graphs				X
analyze the effects of parameter changes on the graphs of functions				X

LANGUAGE ARTS SKILLS	ACT 1	ACT 2	ACT 3	ACT 4
describes main idea	X			
summarizes	X	X		
describes content	X			
identifies point of view		X		
applies technical information	X			
describes personal reaction		X		
makes inference and predicts future events			X	X
summaries	X			
panel discussion	X			
interviews		X		
written reports		X		
memos			X	
letters				X
debates				X

LEARNING ACTIVITY 1

CASE STUDIES

WHAT IS RISK MANAGEMENT?

OBJECTIVES:

Students will apply the Language Arts skills of research, summaries and panel discussions to explore risk management issues.

PERFORMANCE TASK:

Students will research case studies from the Risk and Insurance Management Society, answer questions about the case studies, write summaries, and participate in a panel discussion.

CLASS STRUCTURE:

Students will work in small groups to research and analyze case studies, and lead a panel discussion. Each student will hand in a summary of their research with answers to the questions from the Internet about the case study. The whole class will participate in panel discussion.

PROCEDURES:

Tell students to form small groups and use the ACCR to choose a case study from Internet page of the Risk and Insurance Management Society. Research a risk such as weather, health, accidents, crime products, finances, computer security, etc. Answer as many of the questions given with the case study as possible. As a group lead a panel discussion on the case you have chosen, allowing for participation and questions and answers from the rest of the class.

REFLECTION / EVALUATION:

(Use the following questions during whole class or small group discussion).

What characteristics did the cases you studied have in common?

LEARNING ACTIVITY 2

AN INTERVIEW

WHAT DOES A RISK MANAGER DO?

OBJECTIVES:

Students will apply the Language Arts skills of interviewing and report writing to investigate risk management tasks and careers.

PERFORMANCE TASK:

Students will interview risk managers and write reports on the interviews.

CLASS STRUCTURE:

Students will work in small groups to interview risk managers. Each student will write a report on the interview.

PROCEDURES:

Explain that large companies, schools and hospitals often have personnel assigned to perform risk management. Arrange to interview someone in a local business, school or hospital to find out the purpose of the job, his/her duties, educational background, concerns, and other interesting information about the job. Include in your interview answers to the following questions:

What did the person study in school that helped most with the job? What ethical choices does the job address. Who makes the risk management decisions and how are risk factors prioritized. What are the rewards and drawbacks of the job? What resources does he/she use for measuring risk and making decisions?

FLECTION / EVALUATION:

Use the following questions during whole class or small group discussions.

Would you like to be a risk manager? Why or why not?

LEARNING ACTIVITY 3

PRIORITIZING RISKS

WHICH CHEMICALS ARE SAFEST?

OBJECTIVES:

The students will apply the Mathematics concepts of constructing and drawing inferences from charts that summarize data from real-world situations, operating on matrices; and the Language Arts skills of research and memo writing to analyze the use of hazardous chemicals.

PERFORMANCE TASK:

Using chemical data sheets, students will make cost/benefit analyses of risks, prioritize the desirability of the chemicals, and write recommendations justifying their priorities.

CLASS STRUCTURE:

Students will work in small groups to analyze and prioritize the chemicals. Each student will write recommendations for chemical use. The whole class will discuss the results.

PROCEDURES:

Use ACCR to obtain five chemical data sheets for examination. Make a risk vs. benefit matrix to analyze the effects of each chemical. Based on your analysis, prioritize the chemicals from safest to most desirable to least desirable. Write a memo the manager of a company with recommendations for use of the chemicals, and justify your conclusions, based on your analysis.

REFLECTION/EVALUATION:

Use the following questions during whole class or small group discussions.

What difficulties did you encounter in prioritizing chemicals? What factors would cause you to recommend discontinuing the use of a chemical?

LEARNING ACTIVITY 4

MODELING RISKS

USING A MODEL TO EXAMINE RISKS

OBJECTIVES:

The students will apply the mathematics concepts modeling real-world phenomena, representing and analyzing relationships using tables and graphs, analyzing the effects of parameter changes on the graphs of functions, and the Language Arts skills of research, letter writing and debating to model and analyze hazardous waste exposure risks.

PERFORMANCE TASK:

Students will model hazardous waste exposure using an EPA model. They will write recommendations based on the model and hold a debate on the benefits of their recommendations.

CLASS STRUCTURE

Students will work in small groups to model hazardous waste exposure, and hold a debate. Each student will write a letter of recommendation and participate in the debate. The whole class will view and critique the debate.

PROCEDURES:

Work in small groups to do the following:

Use ACCR to acquire a mathematical model and data from the U.S. Environmental Protection Agency's Center for Exposure Assessment Modeling. Put the data into the mathematical model and analyze the behavior of the model. Try changing various parameters to observe their effect on the model.

Write a letter of recommendation to the CEO of a company, explaining your findings and suggesting improvements for the handling of hazardous wastes. Have a debate on the your recommendations, with one side advocating the EPA position and the other side a counterproposal from the company.

REFLECTION / EVALUATION:

Use the following questions during whole class or small group discussions.

Did you acquire from this activity more insight into the perspective of the consumer, risk manager and industry on hazardous waste management?