GEOLOGY IN THE NEWS

David W. Mogk
Dept. of Earth Sciences
Montana State University
Bozeman, MT 59717

Level: Grades 5 and above

Estimated time required: Variable; it is recommended that time be regularly scheduled on a weekly basis during an entire academic year, or on a daily basis during the course of an earth science unit, to demonstrate the close relationship between geology and our society.

Anticipated Learning Outcomes

- Students will discover the underlying scientific principles in common, daily events.
- Demonstration of the connections between geology and society. The earth is at work all around us. We don't have to look too far to see its impacts on society and in our personal lives.
- Demonstration of ways in which nature (hazards, resources, etc.) impacts our society, and ways in which our society impacts natural systems (e.g., waste disposal, groundwater quality, etc.).
- Demonstration of the need to understand fundamental scientific principles to protect our health, safety, and economic security, and to generally become better citizens.

Background

Recent publications from the American Association for the Advancement of Science, Project 2061 Science for All Americans (1989) and The Liberal Art of Science (1990), address the problem of scientific illiteracy in America by proposing some specific recommendations for reform:

1. start with questions about nature;
2. concentrate on the collection and use of evidence;
3. provide an historical perspective, and, I would add, geographic, cultural, economic, and political perspectives as well;
4. acquire scientific knowledge and scientific habits of the mind;
5. insist on clear expression;
6. use a team approach; and
7. engage students actively.

These recommendations contain inherent scientific and human significance in terms of the utility of scientific knowledge, the need for social responsibility, the intrinsic value of knowledge, and the overall enrichment of students through education. There is no better place to discover the
relationship between natural science and our society than through the news media. Every day news items report events or occurrences in natural systems that impact personal lives, communities, and planetary systems. This provides a very convenient format to explore the scientific basis for the event, cause and effect, and the direct relationship between science and the community-at-large.

**Materials**

- Newspapers, magazines, other printed material
- News reports from TV or radio.

**Procedures**

Students should be assigned (or encouraged) to read the newspaper on a daily basis, listen to news on the radio, or watch on TV, to acquire material related to the earth sciences. Natural hazards (earthquakes, volcanoes, landslides, hurricanes, etc.), human-made hazards (urbanization, other compromised engineering projects, etc.), environmental issues, resource extraction issues all appear in the news with great frequency and are easily accessible to students. For lower grades, teachers or parents can contribute these news items. Global events may be of general interest, but there is sure to be a wealth of information on the local level as well (water quality, solid waste management, development issues, etc.). The news items may then be presented to the class as a) "show-and-tell" exercises, with follow-up discussion by the class, b) a bulletin board that could be dedicated to posting the geologic events of the week, c) scrapbooks of events, either chronologically or category of events compiled by individuals or classes. If you do this over the course of a year you will be amazed at how much newsworthy information is earth-related.

**Results and Discussion**

Acquisition of this informational database serves many classroom needs:

- Discussion of the news articles is inquiry-based. It may be sufficient to simply ask the question, "What's wrong with this picture?" to start a discussion that will lead to a whole series of subsequent questions by the students.
- Understanding of the news articles is discovery-based. Students should be encouraged to ask questions about the circumstances surrounding the event to understand the nature of the event, and its impact on personal lives and/or community. These articles (and pictures) provide graphic means to help students discover underlying scientific principles.
- Cause and effect is amply demonstrated. The scientific method can be applied towards interpreting the circumstances. Hypotheses can be formulated and tests proposed based on the information available.
- Critical thinking is fostered through the acquisition, prioritization, and interpretation of information. A dose of Cartesian "hyperbolic skepticism" is warranted, and students should be encouraged to ask who is telling the story, to what audience, and for what purposes; are there alternate interpretations?
• The collection of news items can serve to make connections to other academic subjects. Numbers in the articles can be evaluated in terms of order of magnitude and scale of observation, and practical application of mathematics can be extracted from the articles (e.g. what is a part per million?). These articles can be the basis of short writing assignments, or art projects. Locations of the events can be related to geography, and the historical perspectives can be explored.

• Connections to personal lives should be emphasized to demonstrate that science is important, interesting, and even fun.

• Encourage diversity in relating to the news stories. Students from different cultures, economic classes, and geographic locations all have an important contribution to make towards the understanding of news stories. Rely on these different life experiences to explore the meaning of the stories. Accept the diversity of cognitive processes that lead to understanding. This does not mean that all offerings by the students need to be accepted uncritically; misconceptions, falsehoods, and prejudice must be addressed directly during class discussions. However, students must be secure in knowing that they all have access to the material, and that they can all make valuable contributions towards understanding the material at hand.

• Develop exercises that allow students to describe the news events, and to explain the circumstances and consequences. Clear articulation of the situation, related questions, and possible solutions is essential. Let students work together to understand the issues and to formulate solutions.

• Instruction around topical issues is "open-ended"; there is no way to predict the type of material that might be submitted. And there is not necessarily a "right" answer to many complex issues as reported in the news. Don't be afraid to say "I don't know"; but also be willing and prepared to say "But here's how we can find out." Offer this as a challenge to the student to teach you something (i.e. acquire new information). This is the early workings of the scientific method through questioning, testing, and trying new approaches, and is an important step towards "acquiring scientific habits of the mind".

• This "open-ended" approach does put the teacher somewhat at risk with respect to exposure to material that may not be familiar, and perhaps during discussions of controversial news items. But in this risk there are also great opportunities in making science accessible and relevant to all students.

Additional Activities

Follow the development of local Earth-related issues with invited presentations from business people, city or county government officers, local activists, etc. to explain their involvement with the issues. If possible, schedule field trips to visit specific sites related to the news items: country landfill, watersheds, sanitation department, etc.

Selected References