Remediation Methods

Time: 90 minutes plus work outside of class

Supplies:

Supplies for building a model
Scenario handout – Iron Mine Old/No. 8 Mine Seep*
Iron Mountain Mine Case Study
Science of Acid Mine Drainage Handout
Wetlands Handout
Internet access
Project Criteria Rubric

* Pages 1-25 in the scenario report provide background information on environmental conditions including water quality data on page 20. Pages 35-36 contain a general map of the area. The remainder of the report details the possible remediation actions and their theoretical outcomes. Teachers or students are welcome to select a different mine scenario or site if desired.

Activity:

1. Students will divide into groups of 2-4.
2. Have students read the Science of Acid Mine Drainage Handout, the Wetlands Handout, and investigate some of the links posted on the module introduction page.
3. Have students read the scenario describing an acid mine drainage problem and visit the EPA's Superfund site if internet access is available: http://yosemite.epa.gov/r9/sfund/r9sfdocw.nsf/vwsoalphabetic/Iron+Mountain+Mine?OpenDocument. They should also read the Iron Mill Mine Case Study. The scenario provided covers information on a particular area of the EPA's Superfund site, Iron Mill Mine in California. Students are to focus their project on the Old/No.8 Mine Seep area.
4. Instruct students to also use the links on the AMD service learning webpage provided and browse the internet to learn more about remediation techniques.
5. Students will select AMD remediation techniques to use in the development of their reclamation plan. Students may select any AMD techniques they choose even if they are not in the PowerPoint presentation or in the links provided.
6. Students must show the chemical reactions that occur within their treatment system, the factors that contributed to the selection of their remediation technique, and an understanding of the costs and benefits of their plan.

7. Students will design a 3 dimensional model of their plan.
8. Each group will give a five-minute presentation of their proposed plan to the class that demonstrates their understanding of the information from Step 5.

There are many sites online with information on AMD remediation techniques that students would benefit from visiting. Some of them are: http://pubs.ext.vt.edu/460/460-133/460-133_pdf.pdf (Virginia Cooperative Extension, Passive Treatment of Acid-Mine Drainage), http://anr.ext.wvu.edu/land_reclamation/acid-mine-drainage (WVU Extension Service, Acid Mine Drainage), http://el.erdc.usace.army.mil/elpubs/pdf/sr14.pdf (Army Corps of Engineers, Acid Mine Drainage Treatment), http://digitalcommons.unl.edu/cgi/viewcontent.cgi?article=1018&context=usblmpub (University of Nebraska – Lincoln, Passive Treatment Systems for Acid Mine Drainage), and http://www.amrclearinghouse.org/ (Abandoned Mine Reclamation Clearinghouse).