

Teacher's Guide

Prior to teaching the lessons, students need to take the pre-assessment test online (to be graded by CUSP). It is the same test they will take for the post-assessment.

Use the PowerPoint presentation to introduce the concept of acid mine drainage to your students. The presentation also describes acid rock drainage, which forms through the same chemical processes as acid mine drainage. Discussing acid rock drainage is meant to inform your students that natural geology can be deleterious to the environment in the same manner as man-made features. The presentation also includes information about reclamation techniques that your students will use for their final activity.

After presenting the PowerPoint, introduce the “Remediation” activity in which students have the opportunity to develop their own acid mine drainage reclamation plan for a specific abandoned mine scenario. Students should be given instructions for this activity in the beginning of the week so that they have adequate time to work on it outside of class before the presentations of their projects at the end of the curriculum. This activity has several documents for students to read, as well as some online documents and websites for students to explore that will provide them with more information for their remediation plan. The scenario selected is an EPA Superfund site, the Iron Mill Mine, in California. Reports are provided as well as a link to the EPA website. Teachers are welcome to select a different scenario if they choose.

In “pH, Alkalinity, Acidity, Oh My!” students will be performing titrations in a laboratory setting. The experiment mentions the use of a HACH Acid Mine Drainage kit. These kits are not necessary and students will gain more laboratory skills by using standard lab equipment and performing a titration. Also, as noted in the instructions, if you do not have access to a sample of acid rock or acid mine drainage, you can make your own by dissolving ferrous sulfate with water. There are several pages within the activity .pdf specifically for students. I have created separate .pdfs of these documents in the module. They are:

Student pH Info

Student pH Instructions

Student pH Worksheets

Student background information and instructions for the Sedimentation activity are in one document, “Student Sedimentation.” If you are short on time, teachers can do the sedimentation activity as a demonstration rather than a student experiment.

At the end of the classroom curriculum student will be administered the post-assessment test (to be graded by CUSP) and will participate in a service-learning day with CUSP staff.