



Title:
REOPEN? : A study of five closed mines

Author:
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Grade Level and subject:
 Mining
 Grades 5 through 8

Time Frame:
 11 weeks (one meeting a week)

Introduction:
 Students will analyze various data to determine which of five currently closed mines would be most beneficial to reopen. (If I can procure data from copper mines in Michigan, these will be used, if not, the data will be from gold mines in Nevada). The task places students in the roles of partners in a mining company. Students will acquire then use their knowledge of rocks and minerals to analyze data from abandoned mines and choose one for their company to reopen.

Curriculum Standards:
National Science Content Standards

.Content Area	Standards
Physical Science	A1, A2
Earth Science	A3, A4, A7
Science in Personal & Social Perspectives	B1, B2, D2, E4, E5
History and Nature of Science	A1, A2, B3



NYS Standards: Mathematics, Science, and Technology

- Standard 1: Analysis, Inquiry, and Design
- Standard 3: Mathematics
- Standard 4:
- Standard 5:

Overview:
 This student will allow students a better understanding of how minerals are extracted from the earth. The unit is designed to have students look at many various concerns that

mining companies must address in order to successfully extract ore from the earth safely, but also turn a profit. There will be opportunity to explore various aspects of the mining industry and look at possible career choices.

Desired Outcomes:

Student Will Be Able To:

- ❖ Understand the importance of company name and logo
- ❖ Work productively with a group to make creative decisions
- ❖ Learn various jobs within the mining industry
- ❖ Have a better understanding of different types of mines and how they operate
- ❖ Understand the importance of any given job in relation to other jobs within the mining industry
- ❖ Appreciate the risk involved in mining
- ❖ Better understand where their mineral originate
- ❖ Understand decision making through process and group effort
- ❖ Analyze data
- ❖ Create elementary level cross sections
- ❖ Understand the importance of safety
- ❖ Follow the progress in mining and learn some history of old techniques no longer used

Individual Lessons:

It's all in the name: Students will form groups and will be asked to choose suitable name for their mining company. They will be asked to make a poster that clearly shows their name and their company logo. They will need to present a rationale for their name and logo choice

Bingo (pre-vocabulary activity):

This is an activity that I like to do in the very beginning of a unit. I find that it takes some of the mystery of new words and makes it fun and exploratory. Kids get a 25 square bingo sheet and a list of words. Students then fill in the squares however they like. They do not necessarily have to know the word. I then read the definition of a word out loud and the students put a chip on that square (if they have it on their sheet). The first to get five in a row (vertical, horizontal, or diagonal) wins. They must say what words were filled in and the loose definition.

What do I do?

Students will be assigned a job within their company and receive a brief handout on what their job entails in the “real world” and within the parameters of this particular project.

Jobs include:

Geochemist

Geologist

Environmental Hazards Specialist

Metallurgical Engineer

Operations manager

Mineral Economist



Depending on data available students will work with one other person from their group to analyze the data as it applies to their particular field. This will be done for five sets of data.

Stages of Mineral Production:

This will be presented along with a PowerPoint presentation of my summer at Michigan Tech. We will also view one of the videos included in our “goody bag”, undecided at this time. We will focus on the following stages

Exploration/prospecting

Development

Production

Milling

Reclamation

These are other lesson plans that will go with the unit:

Assay Lesson Plan

Cupcake Drilling

Cross Sections

Panning

Cookie Mining

***NOTE:**

Students will be given time during each class meeting in which to go over data that is important for their particular job descriptions. Each group of job holders will have a mini conference with me as to how to interpret their data and how to use a particular rating system to help their analysis. Groups will include at least one 8th grade student as the overseer of the project so that they can troubleshoot and help younger students who have difficulty.