

Assignment – Where’s That Mine of Mine?

Explore some of the factors involved in opening a new mine as they might apply to mining a theoretical mineral (“amazite”) in various regions around the world. Present your findings in writing and/or in a presentation to the class.

Teacher Instructions

Instructor Preparation

The student(s) will be assigned to evaluate a number of possible mine sites, randomly selected from among 12 possible coordinates in a 40,000 mi² area around that location. To maximize the “random” aspect of the selection, have students write down ten numbers from 1 to 12 BEFORE giving them the rest of their instructions. These numbers will be used in other portions of the assignment as well.

Their simplified evaluation will be based on criteria and assumptions identified below, and they will rank their potential mine sites in order from most to least favorable, with supporting rationale.

It's important to help students understand that this is a simplified evaluation. Actual exploration and evaluation processes often take years (5-20+) and are far more complex than this assignment will allow. However, students will still take into consideration some of same factors that affect the development of modern mines.

For each individual or small group working on the assignment, identify a location anywhere in the world—the more variety the better. If you are just conducting the project for the class as a whole, feel free to use your city or town!

Locations may be picked more or less at random, although we would suggest not picking locations where the search area will be completely in a protected environmental area or water. Challenging locations do not need to be completely avoided as could allow students to thoughtfully weigh the pros and cons of a site. **A key lesson here is that options are limited when it comes to opening new mines. We have to mine where the minerals are, not where it would be more convenient for them to be, so the importance and need for the mineral must be weighed against the specifics of any potential mine site.**

Possible locations:

| | | |
|-------------------------|-----------------------|--------------------|
| Grande Prairie, Alberta | Rock Springs, Wyoming | Peoria, Illinois |
| Portsmouth, Ohio | Aguabuena, Peru | LaGrange, Georgia |
| Abilene, Texas | Valdez, Alaska | Hermosillo, Mexico |
| Roswell, New Mexico | Newman, Australia | Prague, Czechia |
| Moab, Utah | Yaoundé, Cameroon | Abuja, Nigeria |

Delivery of the student work may be in written form and/or a presentation to the class.

Student work may be scored based on criteria including:

- 1) Technical accuracy in mapping locations of potential mine sites and identification of critical factors (environmental, geographic and social) impacting each site's suitability.
- 2) The thoroughness of the research regarding each potential mine site.
- 3) Sound interpretation of their findings.
- 4) Rationale presented with their recommendations.
- 5) Quality of final presentation of their work.

Notes:

- In reality, there is an abundance of science and engineering practices used to identify locations of mineral resources. However, given the somewhat random way in which this exercise's potential mine sites are identified, there are no pre-defined answers. This is why students need to explain their rationale, backed up with results from their research.
- You may want to go through the activity yourself once to familiarize yourself with the process and get a feel for what sort of information you will expect the students to find and report on.
- Additional student assessment may incorporate vocabulary quizzes and assignments asking students to report on current mining operations (locally or around the world), reclamation efforts and investigation of mining careers.
- For additional activities, seventy-five professionally-developed lesson plans relating to "Ground Rules: Mining Right for a Sustainable Future" for ages 11-18 may be found Cat.com/groundrules.