



Content area: Social Studies

Grade level(s): 3 and 4

A Community is Born

Post-visit Classroom Activity

Objective: This lesson plan is designed to be used in the school classroom, as a follow-up to a class trip to the Sterling Hill Mining Museum. The objective of this lesson plan is for students to experience how and why communities of people are established based on the types of employment available and the natural resources nearby, using the Sterling Hill zinc mine as an example. Students will develop a model mining community town.

NJ Student Learning Standards:

Geography, People and the Environment: Global Interconnections

By the end of grade 5:

6.1.5.GeoPP.2: Describe how landforms, climate and weather, and availability of resources have impacted where and how people live and work in different regions of New Jersey and the United States.

6.1.5.GeoHE.1: Use a variety of sources from multiple perspectives, including aerial photographs or satellite images to describe how human activity has impacted the physical environment during different periods of time in New Jersey and the United States.

• 6.1.5.GeoHE.2: Cite examples of how technological advances have changed the environment in New Jersey and the United States (e.g., energy, transportation, communications).

Background Historical Information for the Teacher: *This information is provided to assist the teacher in preparing for the lesson and should not be read to the students prior to the activity.*

Your class has visited the town of Ogdensburg at the site of one of the most famous mines in the world. New Jersey was for many years a very productive mining state, with over 450 iron mines, about 30 copper mines, and two world-famous zinc mines. One of the zinc mines was in Ogdensburg and the other in Franklin, about 2.5 miles farther north.

The town of Ogdensburg exists because of the minerals found there. The Ogden family began mining iron ore there in the 1700s. Ogdensburg is named after them. Valuable minerals containing zinc with some iron and manganese were identified in the 1800's. To extract the zinc minerals from the dark, underground chambers, the New Jersey Zinc Company needed miners. Miners and their families, in turn, needed a place to live, so houses were built by the company near the mine and sold to miners at very reasonable prices. Roads were built and stores and other businesses were established to support the mining operation. The reason towns are located where they are is usually because of natural resources, such as farmland, rivers, waterfalls, minerals, oceans, lakes, mountains, forests, etc. The owner of the mine property was William Alexander (1726-1783), also known as Lord Stirling, hence the name Stirling Hill Mine (later changed to Sterling). He was a partner in the Hibernia, N.J. iron mine, the forges and furnaces located in Rockaway, N.J., and he owned iron mines in New York State. These mines provided iron to make weapons for the Revolutionary War. Lord Stirling also was a general under George Washington and played an important role in the Revolutionary War. He commanded the troops at the battles of Saratoga, Brandywine and Long Island.

Lord Stirling believed the Sterling Hill deposit was rich in iron ore because he thought the mineral franklinite was magnetite (a rich source of iron). Franklinite and magnetite are both black and look very much alike. He did not know that franklinite actually contains zinc and manganese in addition to iron. Lord Stirling was the first to try to smelt (separate metals from rock in furnaces) franklinite in charcoal furnaces. He failed in this effort. The zinc and manganese would not stay in a liquid state because the charcoal did not produce enough heat. The result was a massive glob of impure zinc, iron and manganese that stuck on the bottom of the furnace. These globs were called "salamanders," and it took 12 yokes of oxen to pull them out, plus the furnace needed to be rebuilt. Lord Stirling never mined zinc because the three main mineral ores of zinc – willemite, zincite and franklinite – were not identified as zinc ore until 1810 and later.

A similar situation may have happened to Dutch explorers in the 1640-1657 timeframe. It is believed by some that they confused the zinc mineral *zincite* in the Sterling Hill area for the copper mineral *cuprite*. After ruining furnaces in an attempt to smelt copper, they gave up on the confusing minerals and moved to Pahaquarry near the Delaware River, where they did mine copper. They shipped the ore to Esopus (Kingston, New York) over the Old Mine Road, and from there to Europe.

In New Jersey there are other towns named after mining, including Wharton, named after Joseph Wharton, owner of iron mines; Mine Hill, so named for the many iron mines there; Hurdtown, in Jefferson Township, named for the owner of the Hurd iron mine; the Hibernia section of Rockaway, named after the Hibernia mine; and Succasunna, from the Lenni Lenape word *Succasunny*, which means iron. Ironia was established as a center of iron mining.

Another essential resource for early mining in New Jersey was the vast forests which provided the wood to make charcoal for smelting the ores. New Jersey's moderate climate, plus the fact that the state receives an average of 44" of precipitation per year, were instrumental to the growth of the forests. However, the hardwood forests were eventually depleted because of the huge demand for charcoal to smelt iron and zinc. The mines alone required 65 to 200 bushels of charcoal for each ton of zinc ore to be processed. Each year more than six million bushels of charcoal were burned in the zinc furnaces at Sterling Hill. This is equal to one acre of trees cut down every day to make the charcoal. And that was just Sterling Hill! Add the Franklin zinc

mine and the hundreds of iron mines using charcoal, and it is easy to see why most of Sussex, Morris, and Passaic Counties looked like the Gobi Desert by 1890!

Beginning in the early 1900's, the use of coal rather than charcoal in the smelting process resulted in large improvements because coal burns hotter, resulting in more efficient separation of manganese and iron from zinc in the mineral franklinite. This mixture of manganese and iron is called *spiegeleisen* and was sold to the steel industry. Most smelters were located in Pennsylvania, close to the coal mines. This is another example of towns forming to take advantage of nearby resources.

There are many reasons why towns in New Jersey and in the United States developed where they did. Remember, many people live near their workplace, and businesses thrive where people live.

Equipment/Materials Needed: Print the map template and, for every two students, provide a copy of the map plus regular and colored pencils, an eraser, and a straight edge. Students may also develop a three-dimensional model of a mining community using a tray with damp sand and stones, cubes, blocks and other appropriate materials that would be necessary for them to build their community.

Class Management: Have students choose a partner with whom to work. Together they will discuss ideas and put together a plan for their community that was formed because of the discovery of a valuable natural resource.

Time: Two to three class periods including final presentations. More time might be needed if students develop three-dimensional models instead of paper representations.

Teaching the Lesson:

1. Introduce the activity to your students by saying something like the following: “Let’s think about our visit to the Sterling Hill Mining Museum and consider what it was like to start a mining business. Let’s say that you and your partner purchased the Sterling Hill land to start a mining business. The time period is the 1850’s. The land is in the middle of forested hills with no other towns nearby. You are knowledgeable of how to extract rock out of a mine.”

Have the students answer the following questions as a group and record a short list of ideas on the board. Accept all ideas.

- Why did you and your partner choose the Sterling Hill area for your mining business? (Because of the natural resources found in the land, e.g., zinc, iron and manganese ores. You knew you could make money and make it a profitable business.)
- What was it like to live in the 1850’s? What kinds of technology would you have access to? What types of skills were needed by the community at large for sustaining life in general? (Consider that most walked to work, to shop, and to visit others. Most women worked in their home caring for children. Many grew all or a portion of their own food and made their own clothes as well. For a list of inventions that shaped the time period, see <http://inventors.about.com/od/timelines/a/Nineteenth.htm>.)
- What kinds of things will you need to start up *and maintain* a successful mining operation? (Equipment and materials to mine, people to work who are skilled and unskilled, places to live, source of food for workers and their families, medical help when

needed, other shops that meet the needs of the whole family, school for the children, etc.)

2. Have each pair of students develop a plan for their new community/town, including the property of the mine. Using the template map, help students understand the layout of the land, and guide them by asking questions regarding where the best areas would be for housing, shops, etc. [Example: “Do you want to put the hotel right next to the river? What if it floods?”] Keep in mind it is the 1850’s. On paper, have students draw the new town, including where the miners work. Developmentally most students in grades 3 and 4 will not draw a top-down view of the town but will draw houses with roofs and windows. That is perfectly fine. Have the students choose a new name for their town as well as a name for the mining company. Focus on the *development* of the community *because* of the jobs provided by the mine and the jobs needed to support mining.

3. When the community maps are completed, have student pairs make a brief presentation of their community to their classmates. Have students consider the assessment suggestions below as part of their presentation.

Assessment:

- Students demonstrated understanding that the natural resources and the mine were the central reasons for the birth of the community.
- Students demonstrated that a community of people working together can makes life better for all.
- Students considered the topography of the land when placing homes, shops, etc. on their maps.

Alternate Activity: Ask students to work in pairs and develop a newspaper advertisement to attract workers of all types to come to their mining town to support the community and its needs. Students should consider the needs of a growing community.

- End -

Authors: Ron Mishkin (historical information), Trish Rokosz (concept and design), Lea Anderson (map).

Ron Mishkin worked for decades as a miner in Arizona and New Jersey, and currently (2012) is a tour guide and member of the Education Committee at Sterling Hill Mining Museum. Mr. Mishkin’s specialty is the mining history of New Jersey.

Trish Rokosz is a retired project director for corporate and community programs for the County College of Morris and currently (2012) serves on the Education Committee of the Sterling Hill Mining Museum.

Lea Anderson is a retired public-school art teacher and now works as a tour guide at Sterling Hill Mining Museum.