**Natural Resources & Mining**

**Objective:** Students understand that mining extracts finite natural resources. Students understand the importance of reclaiming mining sites. Students understand that humans impact the natural environment, and that there are steps humans can take to minimize their impacts.

**Time Consideration:** 45 - 60 minutes

**Materials:** Chocolate chip cookies (a dry, crumbly cookie works well, such as Chips Ahoy or the store brand equivalent), toothpicks, paper, pencils.

**Introduction:** In this lesson, students will use chocolate chip cookies to simulate mining. Students will then attempt to “reclaim” their mining site. Students will understand that reclamation is an important part of mining, and that it is important for humans to minimize their environmental impact.

**Content:**

**Background:**

Mining was a driving force in growing and shaping society in the Great Basin. It is important for students from the region to learn about the ways that humans impact the earth when they mine and how that impact can be minimized. Teaching about mining is also an opportunity to introduce students to the idea that natural resources are finite.

News of gold drove westward expansion in the 1800s. When the Gold Rush in California began to slow, miners looked elsewhere, including Eastern Nevada. In 1859, miners discovered the Comstock Lode in the Great Basin - one of the world’s largest silver and gold deposits. This spurred the development of towns across the Great Basin. Miners learned how to retrieve the deposits, which lay deep underground. Mining continued in Nevada even after the Comstock Lode petered out. The mining industry prevails in the Great Basin today.

Teachers should emphasize to students that the resources that miners extract are naturally occurring - these metals and minerals form within the Earth. Because humans do not create these resources, they are scarce. We cannot create infinite supplies - we must use them and extract them wisely. Mining can have very harmful impacts on the environment. It can create air and water pollution, damage landscapes, and take away habitats from animals. It is important that miners minimize these impacts. One way to minimize these impacts is through mine reclamation. In reclamation, mining companies return mines to environments that can be used. This typically involves stabilizing the area, replacing topsoil, and revegetating the area with appropriate plants. Reclamation is required by law in Nevada.

**Introduction:**

1. Ask students what they know about mining. They will likely be familiar with the industry.
2. Introduce students to the history of mining in Nevada.
3. Ask students: What materials do we mine for? Where do those materials come from? (The Earth)
4. Tell students that today they will “mine” for chocolate chips in a cookie. As students go through the process, they should imagine that their cookie is a patch of land. What is happening to that land?

**Activity:**

1. Give each student one cookie, a piece of paper, a toothpick, and a pencil.
2. Have students trace the outline of the cookie. This is their mining site.
3. Instruct students to use their toothpick to mine the chips out of the cookie. These are their precious metals. They shouldn’t demolish the cookie - they will need to put it back together!
   1. Ask students to reflect.
   2. What happened to their cookie? If this were a piece of land, what would have happened to the plants living there? What about the animals?
4. Once students have mined their chocolate chips, instruct them to put their cookies back together. This is “reclamation.” Students should try to put the cookie as close as possible to its original form. They should not leave any cookie outside of the original site.

**Conclusion:**

1. Lead students through a reflection on reclamation.
   1. Was their reclamation successful?
   2. Does their “land” look exactly like it did before the mining? Will it ever look exactly like it did?
   3. Why is reclamation important?
2. Remind students that reclamation is a very important step for historic and existing mines. However, reclamation cannot restore the land exactly to its natural state. This is why it’s important to mine carefully and only as is necessary.
3. Lead students through a reflection on the finite nature of natural resources.
   1. Are the chocolate chips endless? Will the chocolate chips “come back” to their cookie now that they’ve been mined?
   2. What resources on earth are not endless? (Ex: metals and minerals, clean water, etc.)
   3. Why do we have to be careful about how we use resources that aren’t endless?

**Sources:**

“Explore The Great Basin: Bringing the natural and cultural wonders of the region to the classroom”, Great Basin Heritage Association

**Next Generation Science Standards**

4.ESS3.1: Obtain and combine information to describe that energy and fuels are derived from natural resources and their uses affect the environment. [Examples of renewable energy resources could include wind energy, water behind dams, and sunlight; non-renewable energy resources are fossil fuels and fissile materials. Examples of environmental effects could include loss of habitat due to dams, loss of habitat due to surface mining, and air pollution from burning of fossil fuels.]