

Cookie Mining

Obtained from: <https://www.earthsciweek.org/classroom-activities/cookie-mining>

Activity Source: [Adapted from Women in Mining Education Foundation Activities](#)

Introduction from: <https://fnmieao.com/wp-content/uploads/2022/01/Exploration1RelationshipwithLand.pdf>

Rocks in Ontario are a mixture of sedimentary rocks from when this area was an ancient lake, igneous rocks deposited or brought to the surface by glaciers during the ice age, and metamorphic rocks which have changed during their journey through the Earth's crust. For a map of the main deposits in Ontario, see Simplified Geology and Selected Mineral Deposits This long time on the Earth brings with it ancient knowledge which many Indigenous peoples believe can be learned by spending time with the rocks. Time is a relative thing. To a rock, a year is a fraction of a blink. Rocks, in eurocentric science, are resources to be used. In a larger context, however, rocks are necessary for life itself. Rocks erode to form rigid parts of the soil which provide air pockets for roots to grow. Living things also require trace minerals which are found in rocks and brought to soil by wind and water. Copper found in the veins of rocks made the first copper vessels for moving water. This interdependence with rocks gives a responsibility to only take what is freely given. When minerals are eroded to the surface, they can be used with the appropriate acknowledgement of the gift. When we use machines to cut holes in the land to expose rocks underground, we are taking more than what was given and damage to the water and ecosystem often occurs. (Paraphrased from Braiding Sweetgrass, Dr Robin Wall Kimmerer, Pages 184-185)

“Taking coal buried deep in the earth, for which we must inflict irreparable damage, violates every precept of the code. By no stretch of the imagination is coal “given” to us. We have to wound the land and water to gouge it from Mother Earth . What if a coal company planning mountaintop removal in the ancient folds of the Appalachians were compelled by law to take only that which is given? ... It doesn't mean that we can't consume the energy we need, but it does mean that we honorably take only what is given. The wind blows every day, every day the sun shines, every day the waves roll against the shore, and the earth is warm below us. We can understand these renewable sources of energy as given to us, since they are the sources that have powered life on the planet for as long as there has been a planet. We need not destroy the earth to make use of them. Solar, wind, geothermal, and tidal energy-the so-called “clean energy” harvests-when they are wisely used seem to me to be consistent with the ancient rules of the Honorable Harvest.” Dr Robin Wall Kimmerer, Braiding Sweetgrass, Page 187

Purpose

The purpose of this activity is to give the player an introduction to the economics of mining. Each player buys "property," purchases the "mining equipment," pays for the "mining operation," and finally pays for the "reclamation." In return, the player receives money for the "ore mined." The object of the game is to develop the mine, safeguard the environment, make as much money as possible and reflect on the process..

Materials

- Play money (\$19 for each student)
- [Grid](#) paper (1 sheet for each student)
- Chocolate chip cookie (1 for each student)
- Toothpicks (flat and round)
- Paper clips
- paper towels (for clean-up)

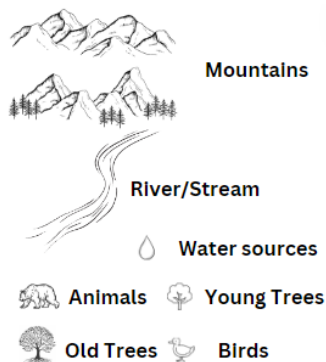
Procedure

1. Each player starts with \$19 of play money.
2. Each player receives a Economics of Mining sheet and a sheet of [grid](#) paper.
3. Each player must buy his/her own "mining property" which is a chocolate chip cookie. Only one "mining property" per player. Two to three types of cookies should be "for sale"; one cheaper one with fewer chocolate chips than the other and another more pricey cookie with more chocolate chips. For example, sell "Chips Ahoy" cookies for \$5.00 and "Chips Deluxe" for \$7.00. Players choose their "properties" knowing that the more chips they harvest, the more profit they make.
4. After buying the cookie, the player places it on the grid paper and, using a pencil, traces the outline of the cookie. The player must then count each square that falls inside the circle, recording this number on the Cookie Mining Spreadsheet along with the properties of the cookie. *Note: Count partial squares as a full square.*
5. Each player must buy his or her own "mining equipment." More than one piece of equipment may be purchased. Equipment may not be shared between players. While mining, **no fingers or hands are allowed**. Please choose mining equipment based on your needs. Mining equipment for sale are:
 - Flat toothpick — \$2.00 each
 - Round toothpick — \$4.00 each
 - Paper clips — \$6.00 each
6. Mining costs are \$1.00 per minute.
7. Sale of a chocolate chip mined from a cookie brings \$2.00 (broken chocolate chips can be combined to make one whole chip).
8. After the cookie has been "mined," the cookie fragments and crumbs should try and be placed back into the circled area on the grid paper. This can only be accomplished using the mining tools — **Remember: No fingers or hands allowed**.
9. Reclamation costs are \$1.00 per square over original count. (Any piece of cookie or crumb outside of the original circle counts as reclamation.)

Cookie Mining Rules

- Players cannot use their fingers to hold the cookie. The only things that can touch the cookie are the mining tools and the paper on which the cookie is sitting.
- Players should be allowed a maximum of five minutes to mine their chocolate chip cookie. Players who finish mining before the five minutes are used up should only credit the time spent mining.
- A player can purchase as many mining tools desired; the tools can be of different types.
- If the mining tools break, they are no longer usable and a new tool must be purchased.
- The players that make money by the end of the game win.

Legend:



Observations and Calculations

Economics of Mining

Type of Cookie			
Price of Cookie			= \$
Size of cookie	_____ squares covered		
Equipment used			
	_____ flat toothpicks	x \$2.00	= \$
	_____ round toothpicks	x \$4.00	= \$
	_____ paper clips	x \$6.00	= \$
Cost of removing			
	_____ minutes mining	x \$1.00	= \$
Total cost of mining			= \$
Total value of chips	_____ chips	x \$2.00	= \$
Reclamation costs	_____ squares	x \$1.00	= \$
Profit or Loss			
	Total value of chips		\$
			-
	Total cost of mining		\$
			-
	Reclamation costs		\$
Circle one: Profit or Loss			\$

Discussion

1. Describe the cookie pre-mining & post-mining. You can describe the physical properties in detail.
2. Did it matter which cookie was bought? Why?
3. Discuss the placement of the cookie. Why did you choose that specific area?
4. Discuss with a partner. Which cookies were harder or easier to mine, and why? Which cookies were more expensive? Why?
5. Which tools, or combination of tools were most effective? Did certain tools break?
6. When you tried to reclaim the cookie, what happened?
7. Was it difficult to return this cookie back to the same exact size that it was before mining the chips? How does this apply to our land?