

Lab Sheet: Cookie Mining

To complete the lab sheet, I...

conducted the experiment

used the video

Learning objectives:

- understand the basic principles of the mining process
- explore the roles of various stakeholders in the mining process
- analyze factors that contribute to sustainable mining practices

Background:

A successful mine takes into account the opinions and needs of many different **community stakeholders** - people in a variety of roles who must cooperate to create a working mine that takes into account the following:

- Production: How much is the mine producing?
- Market: Do people need or want to buy the substance the mine is producing?
- Sustainability: Is this the best place to look for this rare-earth metal? Why would people want to buy this product? Is the mining operation harmful to the environment around us? How are we treating the people who are located around the mine?

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Materials needed	<p>You will need:</p> <ul style="list-style-type: none">• chocolate chip cookie• stopwatch or timer• toothpicks• paper clips• pencil/marker• piece of grid paper (or any scrap paper and create a grid on it)• play money worth \$20.00 (or similar currency, like 20 raisins or chocolate chips)
Hypothesis What do you think will happen?	
Procedure	<p>For this activity, the cookie is the “land” you are mining.</p> <ol style="list-style-type: none">1. Begin by tracing your cookie onto the piece of paper with the pencil or marker2. You are the mining manager which means you are responsible for all of the decisions regarding the mine. Choose your mining equipment:<ul style="list-style-type: none">• \$3.00 for one toothpick• \$4.00 for a paperclip

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Procedure

3. Count all the squares on your grid paper that the cookie covers. Any partially covered squares should be counted as full squares. The cookie outline represents the local community and the environment that your mine is affecting. This also shows the amount of space you need to put your cookie back into, for reclamation. The more pieces that end up outside the mine, the more money it'll cost to reclaim.

4. Check out the mining rules:

- You cannot use your hands to hold the cookie
- You can only use the mining equipment you bought to touch / hold the cookie throughout the entire mining process
- Each chocolate chip you mine is worth \$1.00. You can combine partial pieces to make a whole chocolate chip.
- Every five minutes you mine for costs you \$2.00, so mine efficiently!
- At the end, you have to put the cookie back together with mining tools – no hands allowed!

5. Begin your timer, and start to mine for chocolate chips. Keeping the rules in mind, continue mining until you think you have mined a sustainable amount of chocolate chips.

6. Pick up the cookie and put it back in its original space. If it's not all in one piece, it will cost you \$3.00 to reclaim your mining land. If your cookie has crumbled a lot because of the chocolate chips you have removed, it means your mining caused environmental damage. Once you've pushed it all back into the circle – every square covered by broken cookie outside your circle costs another \$3.00.

7. Record how much money you have left.

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Observations *Remember observations can be recorded with pictures, numbers and/or words!	
Conclusions	

Follow-up questions

- Why did you choose the mining tools that you did? Would you choose differently next time? Why or why not?
- Was it difficult to get the cookie back into the circle? Why or why not?
- What if there had been people living on the mine before you started? How would they feel about the way you left it? What could you do to fix this?
- Was your mine profitable? (Hint: Did you end up with more than \$20.00?)