

MINING IN A NUTSHELL

(Lower grade level version)

INTRODUCTION

Minerals from the Earth are used for a wide variety of purposes. Gathering these minerals and their products is mining.

PURPOSE:

This activity will model the steps that are taken to find, extract, process, and use mineral resources.

OBJECTIVE:

The students will be able to describe the major steps a company must follow from initial discovery of a mineral deposit through consumption of a finished mineral product. The students will formulate ideas of ways to use waste products generated during mineral processing.

ITEMS REQUIRED:

- Roasted peanuts in shell
- Enamel paint in assorted colors (yellow, blue, green, red, black, white)
- Small paint brushes
- Map of classroom
- Blender
- Vegetable oil and salt (Optional)
- Plastic knives
- Celery sticks, crackers, apples
- Rock and mineral samples
- Product examples for samples
- "From the Mine to My Home" poster

TEACHER'S NOTE:

Before class, make the following preparations:

- 1) Paint spots of color on the unshelled peanuts using model or enamel paint. Use several colors; each will represent a different mineral.
 - a) Example: Yellow = Gold, Blue = Silver, Green = Copper, Red = Iron, Black = Lead, White = Gypsum.
 - b) For each color paint 25 to 30 peanuts.
- 2) Prepare a map of the room or location where you will be doing this activity.
 - a) It should show major features like doors, windows, desks, chairs, tables, cabinets, etc.
 - b) A simple drawing on an 8 1/2 by 11 inch paper should suffice.
 - c) Provide copies for each group.



- 3) Hide the peanuts in various locations around the room.
 - a) You can group different colors together. (Several minerals are often found together in nature).
 - b) Keep track of how many peanuts of each color are hidden.
 - i) You can locate and identify them on your master map.
- 4) Have the 'FROM THE MINE TO MY HOME" poster available for class discussion. Available from National Energy Foundation, <https://nef1.org/product/from-the-mine-to-my-home/>.

INSTRUCTIONS:

- 1) Divide students into groups of 4 to 6. Identify each group by a color, for example: a Red group, a Yellow group
- 2) Have the students look around the room to locate where peanuts colored with the color of the group are hidden.
 - a) One student from each group can be assigned to mark on their map where their colored peanuts are, and the number in each location.
 - i) **DO NOT REMOVE AT THIS TIME.**
 - ii) Relate the peanuts to the rock and mineral samples (the rocks may contain useful minerals, just like the whole peanut contains the useful nut within its shell.
 - b) By locating the hiding places, the students have completed the **EXPLORATION** phase.
 - i) Discuss various exploration methods shown on the poster.
- 3) In 3 to 5 minutes, have the students find and remove only the peanuts of their assigned color.
 - a) (You may choose to have one student from each color group do this and return the peanuts to their table or let each group go at one time.)
 - b) Once the group has their peanuts at their table they should count the number of peanuts they found and record that number on their map paper.
 - i) Does their count match the numbers on their map?
 - c) This represents the **MINING** phase.
 - i) Have the groups share their mining successes.
 - ii) Discuss various mining methods shown on the poster.
 - iii) Were they able to collect all of their colored peanuts in the time allotted?
- 4) Have the students shell their peanuts.
 - a) The peanuts and shells should be kept in separate piles at each table.
 - b) Shelling the peanuts represents one step of the **PROCESSING** phase.
 - c) Add all of the shelled peanuts to a blender(s), along with vegetable oil and salt (optional).
 - i) Turn on the blender so the ingredients become peanut butter. This is the second set of the **PROCESSING** phase.



- 5) Using plastic knives, spread the peanut butter on the celery, crackers and apple slices.
 - a) This is the **MANUFACTURING** phase.
- 6) Eat the above manufactured items. This is the CONSUMPTION phase and the one enjoyed most by the students.
- 7) Brainstorm with the students on ways to use the waste peanut shells.
 - a) This is the **RECYCLING/RECLAMATION** phase.
- 8) Use the poster “FROM THE MINE TO MY HOME” to recap the activity.



USES FOR PEANUT SHELLS

- ▢ ROUGHAGE IN CATTLE FEED
- ▢ POULTRY LITTER
- ▢ PET LITTER
- ▢ FILLER IN ARTIFICIAL FIREPLACE LOGS
- ▢ CARRIER FOR AQUEOUS PESTICIDES AND FERTILIZERS
- ▢ ABSORBENT FOR ORGANIC LIQUIDS
- ▢ MUSHROOM GROWING MEDIUM
- ▢ MULCH
- ▢ CARRIER FOR MOLASSES IN ANIMAL FEEDS
- ▢ SEALANT IN OIL DRILLING MUDS
- ▢ METAL POLISH
- ▢ FLOOR-SWEEPING COMPOUND
- ▢ CHARCOAL BRIQUETTES AND ACTIVATED CARBON

