

Choose ONE common electronic item such as a *cell phone, tv, iPad, iPod, laptop, gaming console, etc.* Using the internet and your knowledge, write down 10 “parts” of this object and research what elements and minerals may have been used to produce this part. The first one is done for you as an example.

[illegible]


Next, look up information on the *Surface Mining Control & Reclamation Act*:

What "material" does this law apply to?	
What does the term "reclamation" mean?	
What are the two main program or ideas under the law?	
What year was this law passed?	

Important Definitions (we will do the rest of the lab together):

Ore	Low Grade: High Grade:
Overburden	
Gangue	
Tailings	

Surface Mining	
Subsurface Mining	
Reclamation	

### The Lab:

Today, you will become coal miners...well, sort of!!! Your mining company will be purchasing a plot of land (aka the cookie) and you will be mining the ore, such as coal, (aka the chocolate chips) from this land!

### Procedure:

1. Purchase your land and mining equipment.
2. Find the mass of your cookie and record
3. Place your cookie on a sheet the "mining grid area" and trace the outline. You get to decide where exactly you want to place your cookie.
  - \*Count up the total number of squares covered by your cookie.
  - \*Make a note of the ecosystems that your mining is impacting
4. Start your timer and begin mining. You may not touch the cookie with your hands during mining operations- you must use the mining equipment. **YOU CANNOT TURN OVER YOUR COOKIE!!!**
5. When finished, bring your chips to be massed.
6. Now outline the area in which there are cookie crumbs. Count up these squares
7. Begin the reclamation of your land.
8. Have your land inspected by the EPA.

Costs and Payments:

Store Brand Cookie: \$3.00

Chips Ahoy: \$5.00

Chip's Deluxe: \$7.00

Soft Batch: \$10.00

Flat Toothpick: \$2.00

Round Toothpick: \$5.00

Paperclip: \$6.00

\*\*\*Double rental fee charged for broken equipment\*\*\*

Mining Operation Cost: \$2.00/minute

Reclamation Cost: \$2.00/minute

EPA Charge: \$1.00/square of overburden outside of original lines

Chips: \$10.00/gram

Impure Chips: \$5.00/gram

Mining Data Sheet

Item	Cost/Number
Name of Cookie: _____	Price: \$
Size of Cookie (# squares on graph paper)	
What ecosystems will be affected?	
Mass of Cookie	g
Mass of Chips	g
Rental of flat toothpick	_____ x \$2 =
Rental of Round toothpick	_____ x \$5 =

Rental of paperclip	_____ x \$6=
Broken Equipment Charge	
Mining & Reclamation Time	_____ minutes x \$2/minute=
Total Cost of Mining	
Income from chip sales	_____ grams x \$10/gram=
Profit (Chips-Mining Costs)	
Reclamation Costs	_____ extra squares x \$1/square=
Profit after reclamation	

Was the coal (aka chips) evenly distributed throughout the mine (aka cookie)? Is this a good model for a real mine?

Did you leave any coal behind? Why?

Did you change your mining technique because you knew the land had to be reclaimed? Does reclamation make mining more expensive?

What changes in your mining technique would have made your mining more profitable?

Were you able to restore your land? Why or why not?

# MINING FOR CHOCOLATE

## STUDENT WORKSHEET

Name: \_\_\_\_\_

Date: \_\_\_\_\_

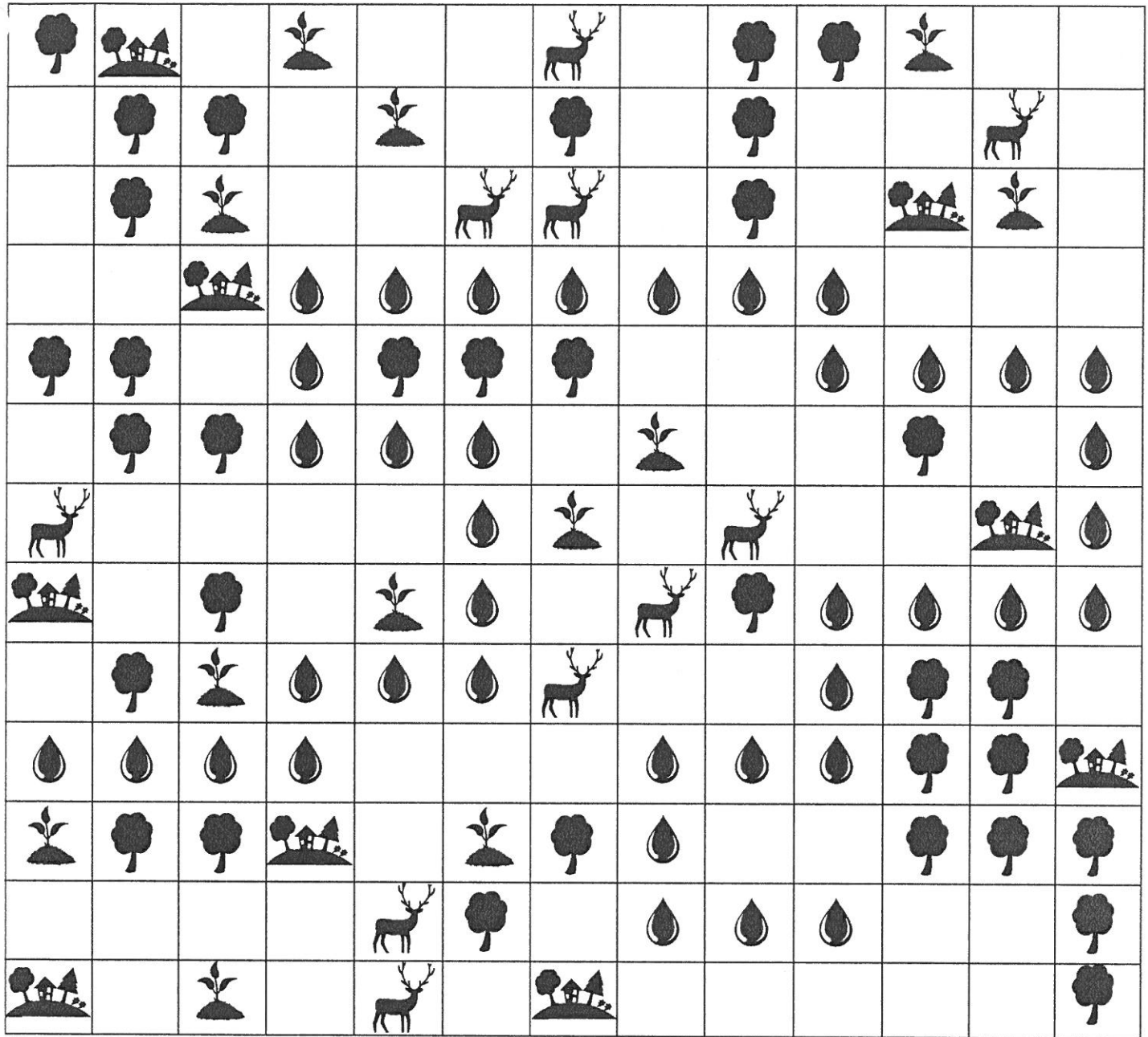
All of the items listed below are made of minerals mined from the ground. In the blank to the left of the items listed, write the letter of the element from which these items were made.

The elements are listed at the bottom of the page.

1. \_\_\_\_\_ Soup cans
2. \_\_\_\_\_ Matches, gunpowder, rubber
3. \_\_\_\_\_ Watches, radios, televisions, radar instruments
4. \_\_\_\_\_ Pencil
5. \_\_\_\_\_ Bricks, pottery, tennis courts
6. \_\_\_\_\_ Pennies, stereo wire, brass instruments
7. \_\_\_\_\_ Wedding band, first-place medal, nuggets
8. \_\_\_\_\_ Soda pop cans, foil wrap, baseball bats, house siding
9. \_\_\_\_\_ Horseshoe, hammer, steel products (cars, eating utensils, swords)
10. \_\_\_\_\_ Food seasoning and preserver
11. \_\_\_\_\_ Plastics, heating fuel, gasoline, vinyl, synthetic fabrics
12. \_\_\_\_\_ Old five-cent coins, paper clips
13. \_\_\_\_\_ Baby powder, crayons, soap
14. \_\_\_\_\_ Jewelry, drill bits
15. \_\_\_\_\_ Charcoal, tar
16. \_\_\_\_\_ Pipes, old paint, X-ray shields
17. \_\_\_\_\_ Flatware (forks, knives, spoons), jewelry, second-place medal

- |                    |           |           |             |
|--------------------|-----------|-----------|-------------|
| A. Gold            | E. Tin    | I. Silver | M. Quartz   |
| B. Aluminum        | F. Talc   | J. Coal   | N. Copper   |
| C. Oil (Petroleum) | G. Lead   | K. Salt   | O. Iron     |
| D. Clay            | H. Nickel | L. Sulfur | P. Graphite |
|                    |           |           | Q. Diamond  |

# MINING AREA GRID



## Natural Attributes:



Tree



Deer habitat



Rich top soil



Water



Beautiful vista