

COOKIE MINING

STANDARDS

See summary of National Science Education Standards.

Original: <http://books.nap.edu/readingroom/books/nse/>

Standard Concept	General Standard	Specific Standard	General Standard	Specific Standard	General Standard	Specific Standard
Grade level		K-4		5-8		9-12
Science as Inquiry (A)	Abilities to do ... inquiry	A.1.4.1	Abilities to do ... inquiry	A.1.8.3		
		A.1.4.2		A.1.8.4		
		A.1.4.3		A.1.8.7		
		A.1.4.5		A.1.8.8		
	Understandings about Science Inquiry	A.2.4.2	Understandings about Science Inquiry	A.2.8.1	Understandings about Science Inquiry	A.2.12.4
		A.2.4.4		A.2.8.3		
Physical Science (B)	Properties of ... materials	B.1.4.1	Properties ... in matter	B.1.8.1		
		B.1.4.2				
Earth and Space Science (D)	Properties of Earth Materials	D.1.4.1				
Science and Technology (E)	Understanding about ... Technology	E.2.4.2				
		E.2.4.3				



Science in Social Perspective (F)	Types of resources	F.3.4.1	Personal Health	F.1.8.7	Natural Resources	F.3.12.1
		F.3.4.2				F.3.12.2
		F.3.4.3				F.3.12.3
	Changes in Environment	F.4.4.1			Environmental Quality	F.4.12.3
		F.4.4.2				
		F.4.4.3				
	Science ... in local challenges	F.5.4.2	Science and Technology in Society	F.5.8.3		



COOKIE MINING

OBJECT: Through this game, the students are introduced to the economics of mining. Students will know that mining requires investment before mining begins, plus costs of permits and environmental monitoring.

INTRODUCTION: The introduction of the economics of mining is accomplished through the players' buying their "properties," purchasing the "mining equipment," paying for the "mining operation," and finally paying for the "reclamation." In return the player receives money for the "ore mined." The objective of the game is to make as much money as possible.

MATERIALS:

- Play money
- Cookie Mining data sheet
- Sheet of grid (graph) paper
- Various chocolate chip cookies:
 - Mother's Chocolate Chip
 - Chips Ahoy
 - Chips Deluxe
- "Mining Equipment"
 - Flat toothpick
 - Round toothpick
 - Paper clip
- Clock or timer (5 minutes mining time)

INSTRUCTIONS (for teacher):

- 1) Each player starts with \$19 of play money.
- 2) Each player receives a Cookie Mining data sheet and a sheet of grid paper.
- 3) Each player must buy his/her own "mining property," which is a cookie. One "mining property" allowed per player. Cookies for sale are:
 - a) Mother's Chocolate Chip - \$3.00
 - b) Chips Ahoy - \$5.00
 - c) Chips Deluxe - \$7.00
- 4) Once the cookie is bought, the player places the cookie 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. Note: Count partial squares as a full square.
- 5) Each player must buy his/her own "mining equipment." More than one piece of equipment may be purchased. Equipment may not be shared between players. Mining equipment for sale is:
 - d) Flat toothpick - \$2.00 each
 - e) Round toothpick - \$4.00 each



- f) 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 1 whole chip).
- 8) Reclamation: After the cookie has been “mined,” it should be placed back in the circled area on the grid paper, using the mining tools. No fingers or hands allowed.
- 9) Reclamation costs: \$1.00 per square over original count.

RULES:

- 1) No player can 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.
- 2) Players should be allowed a maximum of five minutes to mine their chocolate/rainbow chip cookie. Players that finish mining before the five minutes are up should only credit the time spent mining.
- 3) A player can purchase as many mining tools as the player desires and the tools can be of different types.
- 4) If the mining tools break, they are not longer useable, and a new tool must be purchased.
- 5) The players that make money by the end of the game win.
- 6) All players win at the end of the game because they get to eat the remains of their cookie!

REVIEW:

- The game provides each player an opportunity to make the most money that a player could make with the resources provided. Decisions are made by each player to determine which properties to buy and which piece or pieces of mining equipment should be purchased.
- Each player will have learned a simplified flow of an operating mine. Also, each player will have learned something about the difficulty of reclamation especially in returning the cookie back to the exact size that it was before “mining” started.
 - NOTE: For lower grade levels, squares can be used to color in for costs in one color and income in another color.



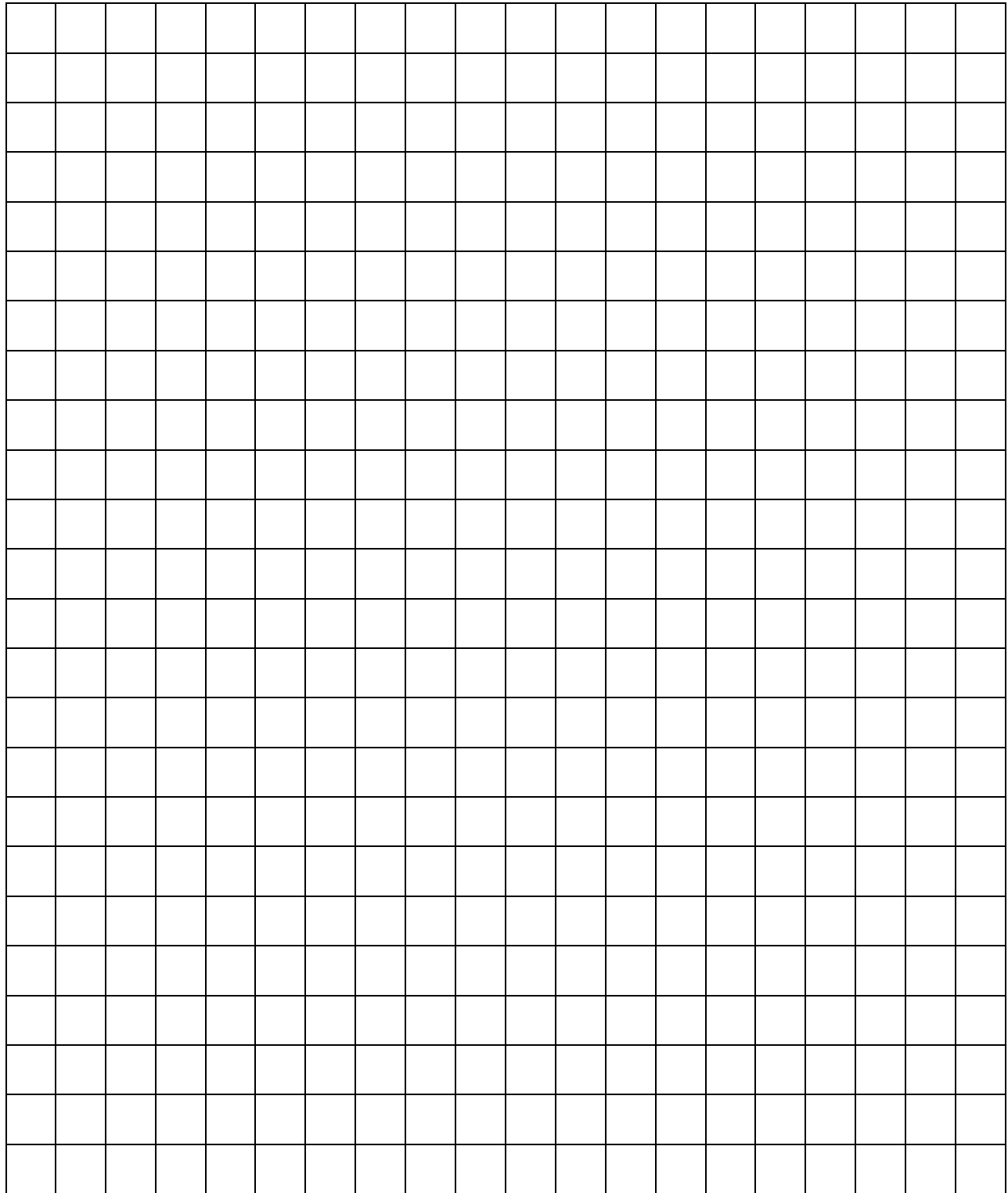
COOKIE MINING DATASHEET

1. Name of cookie
2. Price of cookie
(Mothers \$3.00, Chips Ahoy \$5.00, Chips Deluxe \$7.00)
3. Size of cookie squares covered
4. Equipment:
 - Flat toothpick _____ x \$2.00 = _____
 - Round toothpick _____ x \$4.00 = _____
 - Paper clip _____ x \$6.00 = _____
- TOTAL EQUIPMENT COST
5. Mining: _____ minutes x \$1.00 = Cost of removing chips = _____
6. **TOTAL COST OF MINING** (cookie + equipment + mining time) = _____
7. Income from chips:
 - Number of chips _____ x \$2.00 = VALUE OF CHIPS = _____

How much did I make?		
Value of chips	(±)	_____
Total cost of mining	(-)	_____
Reclamation _____ squares x \$1.00	(-)	_____
PROFIT/LOSS	(±)	_____



COOKIE MINING GRID SHEET, FINER DETAIL



COOKIE MINING GRID SHEET, FINEST DETAIL

