

## ENVIRONMENTAL BINGO

### STANDARDS

See summary of National Science Education Standards.

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

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.1.4.5	Abilities ... to do ... inquiry	A.1.8.7		
	Understandings about ... Inquiry	A.2.4.2				
Science and Technology (E)	Abilities of ... design	E.1.4.5				
Science in ... Social Perspective (F)	... Technology in local challenges	F.5.4.2				



## ENVIRONMENTAL BINGO

### INTRODUCTION

Each area of specialization has a specific terminology that allows specialists to communicate accurately and quickly with each other. Such terminology is not meant to exclude others, but it does require other people to learn the words if they do want to understand the specialists.

### PURPOSE:

Students will become familiar with the need for communication through an introduction to the terminology of the mining and environmental industries.

### MATERIALS

- Terms and definitions sheets for each student
- Definitions cards to be drawn from container
- Container for definitions
- Bingo cards
- Bingo markers

### INSTRUCTION:

- 1) Have the definitions cut up in a container before beginning.
- 2) Instruct the students not to clear their cards when someone calls bingo until it has been verified.
  - a) This saves some upsets if a student has marked the wrong definition on his/her card and the game resumes.
- 3) Have some bingo markers available. (Gummie Bears or M & M's are great or you can have the students mark spaces with a pencil).
- 4) Review the terminology (definitions) with the students then have them put the definition sheet away.
- 5) Give each student a bingo card.
  - a) Students should refer to the list of terms at the bottom of the bingo card to write the terms to fill in each square using one word or term per square.
  - b) Do not put anything in the free space.
  - c) Note that each word can only be used once and there are more terms than squares.
    - i) This allows for more diversity in each of the bingo cards.
- 6) Students should be instructed that the definitions of the terms will be read and if they have the term that matches the definition on their card they should mark that square.
  - a) Definitions are pulled out of the container and read one at a time until someone calls a bingo. (Five squares in a row either horizontally, vertically or diagonally).
  - b) Do not read the part of the definition in parenthesis.

### EVALUATION:

- 1) Which terms were environmental?



- a) Which terms came from the Minerals Industry?
- 2) In reality, do all the terms fit in the Minerals Industry?
  - a) If so how do the terms fit?
- 3) Which terms are specific to modern mining, permitting, and reclamation efforts?

OPTIONS:

- 1) Modify the bingo game by playing 4 corners or blackout.



## ENVIRONMENTAL BINGO TERM DEFINITIONS

Absorbent	A substance that will absorb, drink in, or soak up a liquid.
Backfill	Materials excavated from a site and reused for filling the original excavation.
Background	A constituent level, which occurred before mining activities took place.
BLM	(Bureau of Land Management). A Federal agency responsible for management of certain federal lands following Multiple Use Guidelines.
Bond	Money or financial surety held by state or federal agencies as assurance that reclamation will be completed by the responsible mining company.
Cementation	To fill cavities or plug a drill hole with cement or other material to stop loss of water or entrance of unwanted liquids, gas, or fragmented rock into a borehole.
Closure	Comprehensive evaluation of an inactive mining area to identify and mitigate any chemical impacts resulting from that operation.
Constituent	A chemical or physical parameter measured during monitoring.
Dump	Pile of non-ore (waste) material stacked at the entrance of a tunnel or at the collar of a shaft or open pit.
EA	(Environmental Assessment); lead government agency (BLM, USFS, etc.) predetermines that no significant amount of environmental impact will result from operation, so minimal study (EA) is required. Results can be contested and suspend or delay operations.
EIS	(Environmental Impact Statement); lead government agency determines that there is a possibility of significant environmental impact and a more thorough study is required. Results or decisions are not contestable.



EPA	(Environmental Protection Agency) A federal or state agency that monitors actions taken dealing with the environment.
Endangered Species	A living thing (plant, animal, insect, etc.) that's continued existence is questionable without extra precautions for habitat management.
Forest Service	The management of specific federal lands following Multiple Use Guidelines is performed by this Federal Agency.
Fowl Balls	Plastic balls which float in a process pond to prevent birds from landing in the solution.
Ground Water	That water found underneath the surface of the earth, which permeates the earth's crust occupying spaces, fissures, and fractures.
HDPE	High Density Polyethylene; a plastic material used extensively at mine sites as piping or pond liners.
Impermeable	Not permitting fluids to pass through it; cannot be penetrated.
Leaching	The action of percolating liquid in order to remove the soluble parts.
Monitoring	Routine measurements or sampling of air, water, soil, etc., to detect any impacts to the environment.
Monitoring Well	A pipe set into the ground such that groundwater can be drawn from it for chemical analysis.
Netting	A mesh material used to prevent birds and other animals from accessing solution ponds and open tanks.
Overburden	The soil or rock that covers a mineral source.
Percolation	The slow seepage of water or chemical solution through soils or porous deposits.
Permit	A formal document issued to a mining company from local, state, and or federal agencies, which grants permission for mining to occur with certain limitations.



Piezometer	A pipe set into the ground such that groundwater elevation measurements can be made.
Pollution	Waste material discarded or discharged into earth, air or water that is harmful to the environment.
Process Pond	An engineered, lined pond used to contain chemical-bearing solutions needed for mineral processing.
Reclamation	Surface restoration of an inactive mining area including recontouring and reseeded.
Re seeding	Application of seed mixtures to reclamation areas to re-establish vegetation.
Stormwater	Rain and snowmelt (meteoric water).
Surfacewater	Water which occurs on the surface of the ground.
Tailings	The waste material left over after mining and milling processes have been completed.

**\*Note: Do not read the part of the definition in parentheses.**



## ENVIRONMENTAL BINGO

		<b>FREE</b>		

### TERMS TO ENTER INTO BINGO CARD

<b>ABSORBENT</b>	<b>HDPE</b>
<b>BACKFILL</b>	<b>IMPERMEABLE</b>
<b>BACKGROUND</b>	<b>LEACHING</b>
<b>BLM</b>	<b>MONITORING</b>
<b>BOND</b>	<b>MONITORING WELL</b>
<b>CEMENTATION</b>	<b>NETTING</b>
<b>CLOSURE</b>	<b>OVERBURDEN</b>
<b>CONSTITUENT</b>	<b>PERCOLATION</b>
<b>DUMP</b>	<b>PERMIT</b>
<b>EA</b>	<b>PIEZOMETER</b>
<b>EIS</b>	<b>POLLUTION</b>
<b>EPA</b>	<b>PROCESS POND</b>
<b>ENDANGERED SPECIES</b>	<b>RECLAMATION</b>
<b>FOREST SERVICE</b>	<b>RESEEDING</b>
<b>FOWL BALLS</b>	<b>STORMWATER</b>
<b>GROUND WATER</b>	<b>SURFACEWATER</b>
	<b>TAILINGS</b>

