

Title: Miners

Level: Primary

Time: 5-6 days

KERA Goals: 2.36

Objective: Review language and math skills while learning coal safety and facts.

Materials: Duplicate puzzles and worksheets

Background Information: Who are the people that dig coal from the earth?

These people are called miners. Since safety is very important to mining, miners wear and carry several items to help keep them safe. A hard hat with a battery-powered light is worn for better vision underground. A self-rescuer, or gas mask, is carried to filter out harmful gas. To protect their legs, miners wear ankle straps to keep their pants from being caught in machinery. Safety glasses are worn for eye protection. Steel-toed shoes are worn to protect their feet from falling rocks, coal, and other heavy objects.

Underground mines use special air systems to force fresh air into the mine because of all the dust particles and natural gases that are found underground. The air is tested and checked regularly for high levels of gas. Mines are also well lit so the miners can find their way around the mine and operate the equipment safely.

Activities:

1. ENERGY PICTO-SPELL FACT

Today safety measures in coal mines are strict.

2. SPELLING DEMONS AND ENERGY

Miners are strict about safety.

3. PASTE-N-PLACE

Many safety items are worn by miners.

4. MR. ALUMPA COAL'S SAFETY SEARCH

Hat

5. MR. ALUMPA COAL'S SAFETY SEARCH

Safety glasses

6. COAL=SUM DIFFERENCE

Miners wear safety glasses.

7. COAL PATTERN PHRASE

Over the years, Illinois miners have dug their coal from only about twenty large coal seams.










8. COAL CODE DETECTION

To reach coal deep under the ground, miners often have to drill through sandstone, shale

and limestone.

1. A Picture-Spell Word Puzzle

ENERGY PICTO-SPELL FACT

				
-O-TH	-R-GON	PON-	-K-TE	GIRA-F-
				
FAC-OR-	HA-M-R	M-RBLE-	N--SE	G-E-E
				
-NDIA-	-O-KIE	-PP-E	HEL-ET	-SLA-D
				
N--T	B-R--L	--AMP	W--ST	PARA-HU-E

T_____

Instructions:

Spell an energy sentence from missing letters in the 20 picture words. Each box contains a picture and an incomplete word. To spell the words in the sentence below, place the missing letters on the dotted lines. The first letter, T, is already done.

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DIRECTIONS: Begin at the top space on the left and moving across each row left to right, find the words that are spelled correctly and place the letters above the words with the correct spelling to fill in the blanks. Skip the boxes and letters that have spelling demons (misspelled words). When the exercise is completed, there will be a true energy statement.

Answers for Spelling Demons and Energy

MINERS ARE STRICT ABOUT SAFETY.

Extension Activity: Spell a word with the letters above the misspelled words.

Answer: The word, TECHNOLOGY, can be spelled using the letters above the spelling demons.

3. Paste-N-Place

PASTE - N - PLACE

DIRECTIONS: Help Mr. Alumpa Coal stay safe. Cut out the hard hat, gloves, safety glasses and shoes and paste them on Mr. Alumpa Coal.

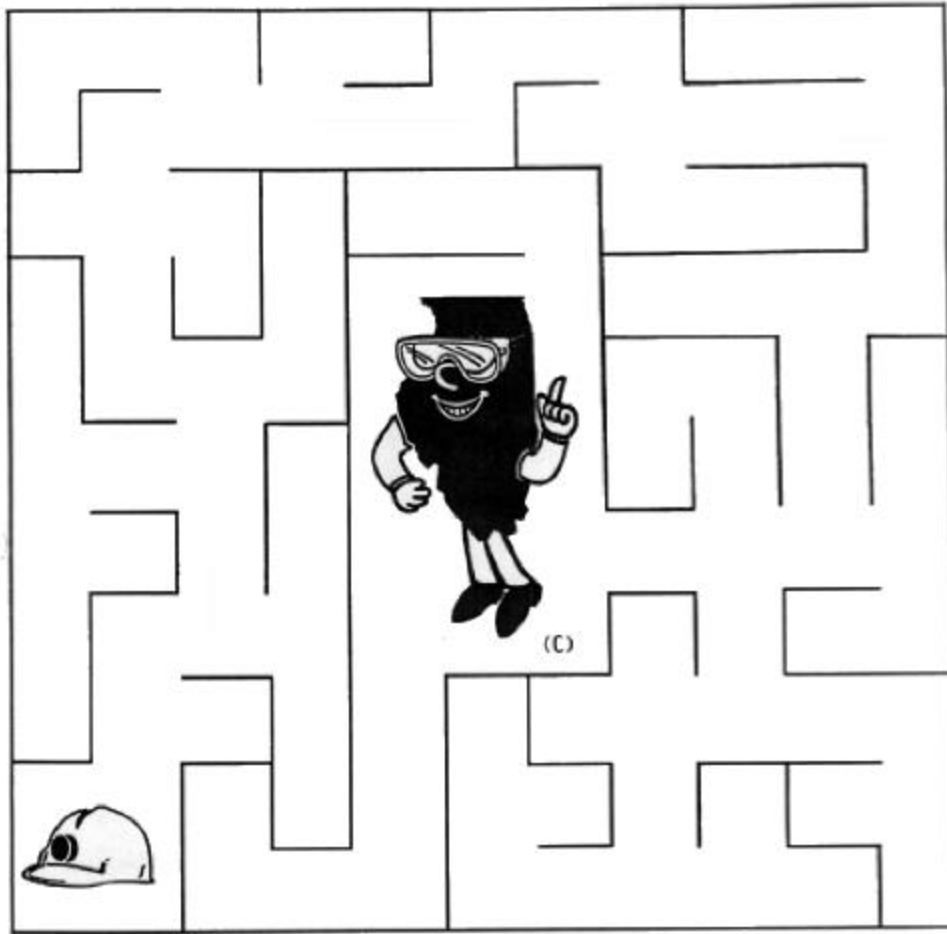
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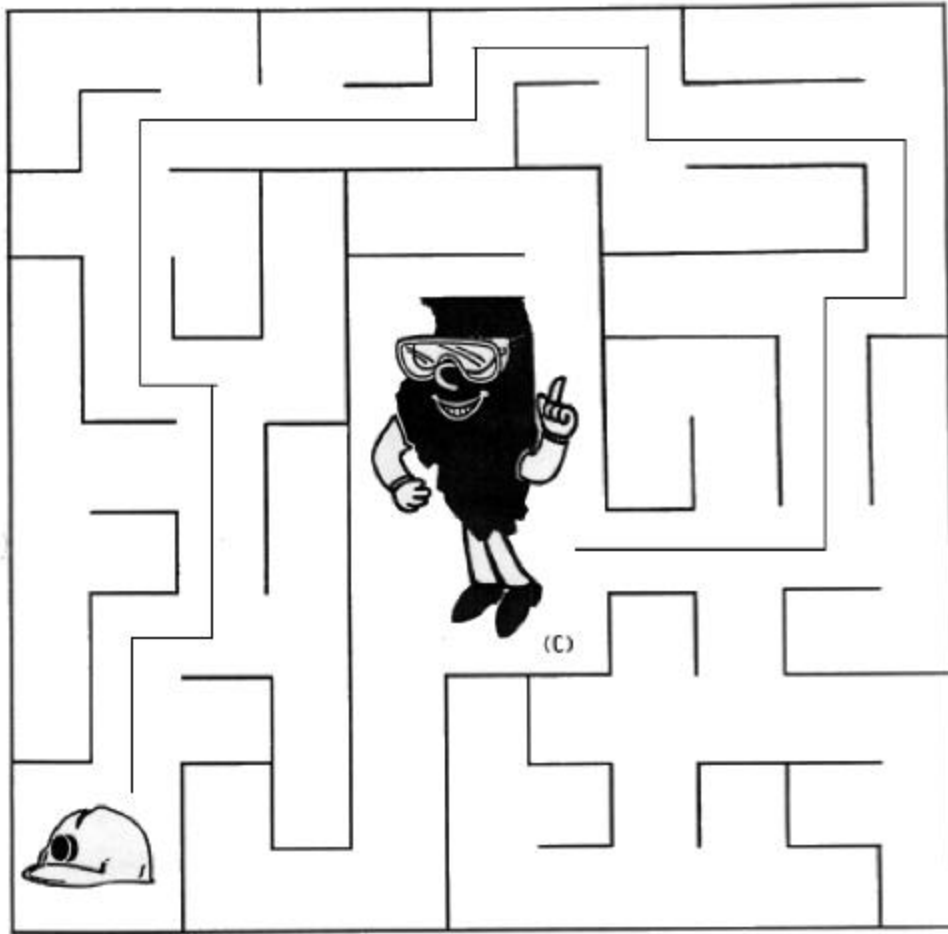
Many safety items are worn by miners.

4. An A-Maze-In Search Puzzle

MR. ALUMPA COAL'S SAFETY SEARCH

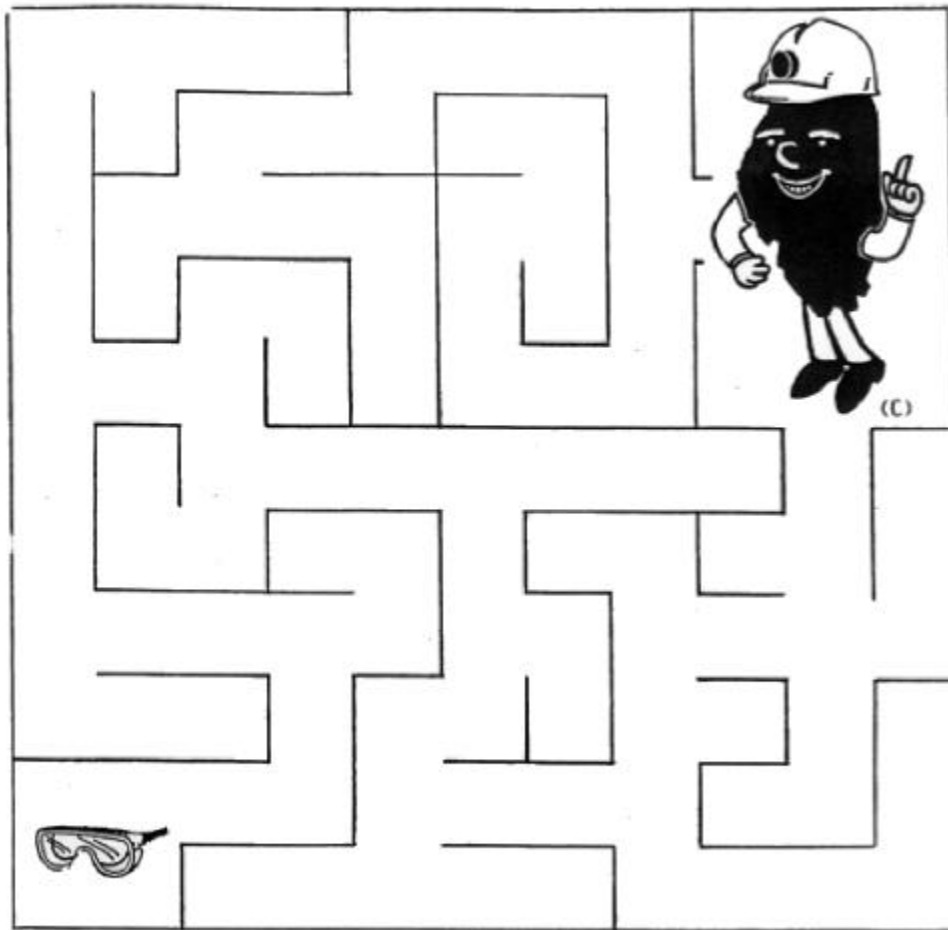


DIRECTIONS: A coal miner wears four safety items in his/her work: a hard hat, a pair of safety glasses, a pair of steel-toed shoes and gloves. In this exercise, MrAlumpa Coal has lost his hard hat and is trying to locate it. CAN YOU HELP MR.ALUMPA COAL FIND HIS HARD HAT? Begin from his location and travel through the maze until you find the hard hat. There is only one route to take to reach it.

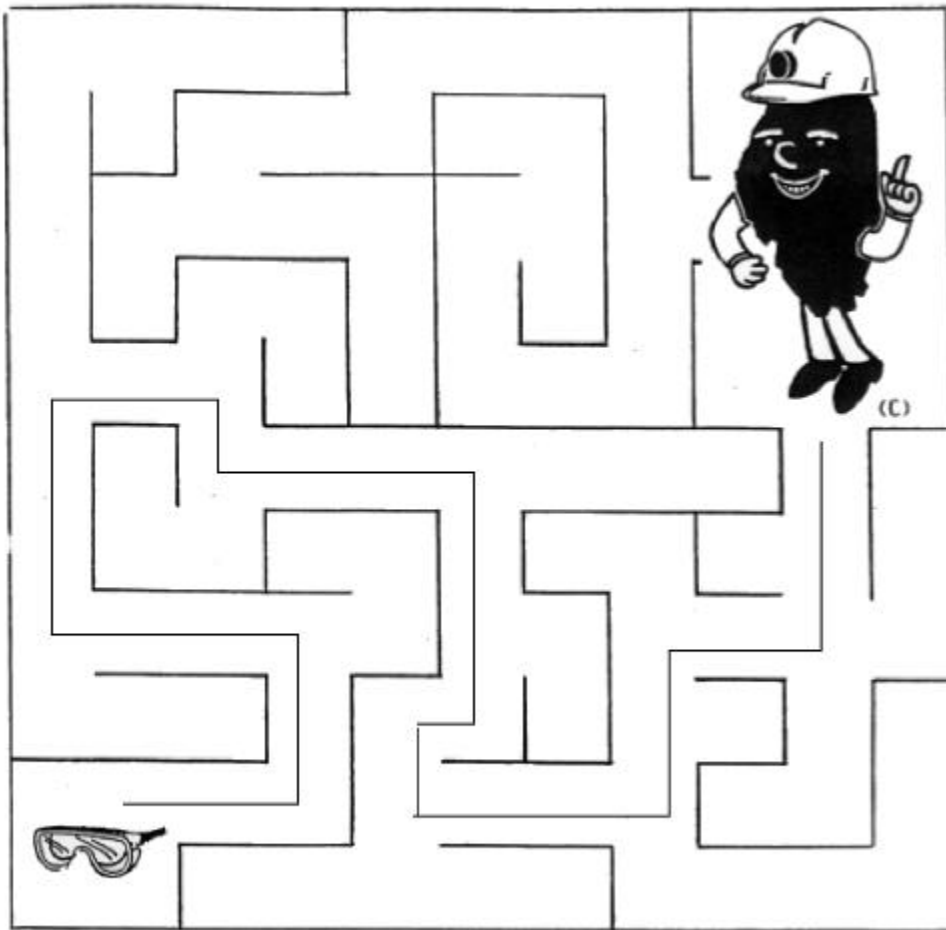


5. An A-Maze-In Search Puzzle

MR. ALUMPA COAL'S SAFETY SEARCH



DIRECTIONS: A coal miner wears four safety items in his/her work: a hard hat, a pair of safety glasses, a pair of steel-toed shoes and gloves. MrAlumpa Coal has lost his safety glasses and is trying to locate them. **CAN YOU HELP MR.ALUMPA COAL FIND HIS SAFETY GLASSES?** Begin from his location and travel through the maze until you find the safety glasses.



6. A Math Code Word Puzzle

COAL=SUM DIFFERENCE

1	2	5	11	5	8	4	3
+1	+7	+6	-6	+2	-5	+4	+2
3	11	7	2	9	1	8	6
+1	-4	-4	+2	+3	+4	-7	+7
11	9	7	2	6	4	11	
-5	+1	-3	+1	-3	+1	-8	

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LETTER CODE

1	2	3	4	5	6	7	8	9	10	11	12	13
T	M	S	A	E	G	R	W	I	L	N	F	Y

DIRECTIONS: Add or subtract the problems and then find the answers in the letter code. Put the letters on the dotted line.

Answers for Coal = Sum Difference

Instructions for Exercise:

Students will solve 23 addition and subtraction problems. Match the answers with the letter code. Transfer the letters below the answers to the dotted line. . For example, an answer of two has the letter M in the code.

1	2	5	11	5	8	4	3
+1	+7	+6	-6	+2	-5	+4	+2
2	9	11	5	7	3	8	5
3	11	7	2	9	1	8	6
+1	-4	-4	+2	+3	+4	-7	+7
4	7	4	3	12	5	1	13
11	9	7	2	6	4	11	
-5	+1	-3	+1	-3	+1	-8	
6	10	4	3	3	5	3	

ANSWER: MINERS WEAR SAFETY GLASSES.

7. An A-Maze-In Pattern Word Puzzle

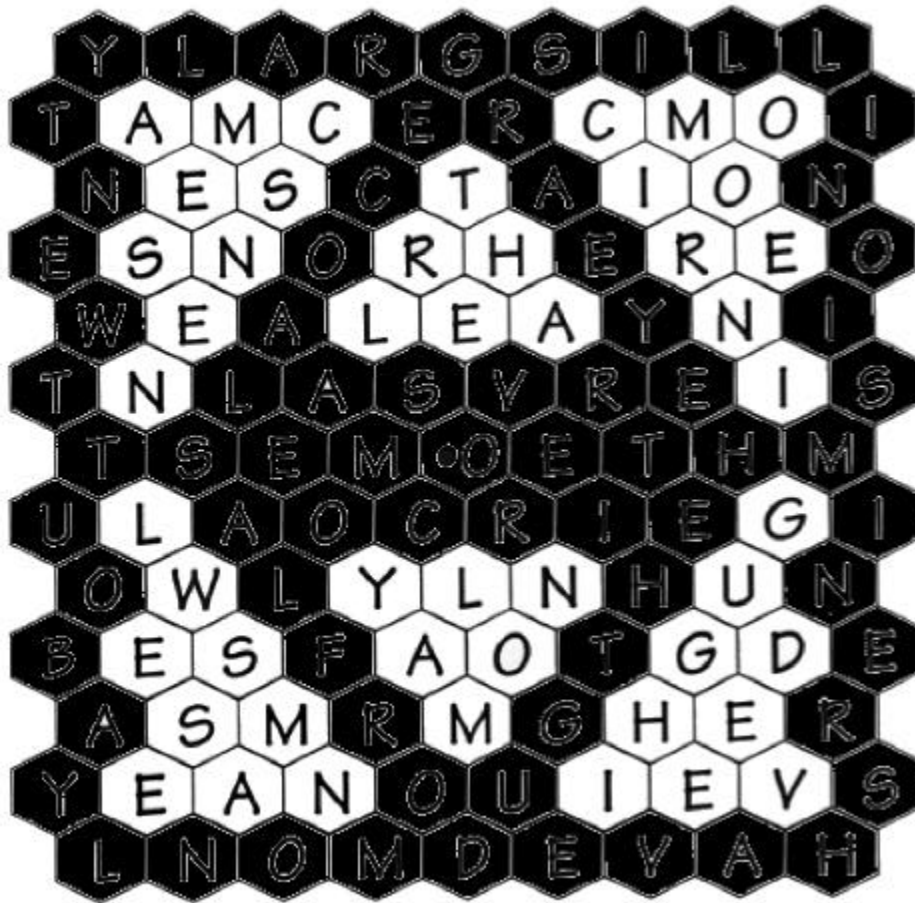
COAL PATTERN PHRASE



OVER THE YEARS, ILLINOIS MINERS HAVE DUG THEIR COAL FROM ONLY ABOUT TWENTY LARGE COAL SEAMS.

DIRECTIONS: Begin at the dot in the middle of the puzzle and connect all the hexagons (six-sided figures) by moving in any direction to spell all of the words in the energy sentence: OVER THE YEARS, ILLINOIS MINERS HAVE DUG THEIR COAL FROM ONLY ABOUT TWENTY LARGE COAL SEAMS. This is a maze, so a wrong letter may be followed. If this happens, retrace the route and continue with the remaining words in the sentence. There is only one correct route. When the route has been marked, color all the hexagons that are on that route.

Answers for Coal Pattern Phrase:



8. A Code Word Puzzle

COAL CODE DETECTION

Directions: Search for the coal fact. Each line has one or more words with a slant mark (/) placed at the end of each coded word, except for the last one which ends with a period. The numbers from 1-26 are arranged numerically with each letter of the alphabet matched with one of the numbers as the code. For example, the first number is 15 which is T, followed by 3 which is O. Continue with the remaining numbers until the hidden coal fact is found.

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26
 U M O A D L R B X F Q C I J T G V W K E N S P Z H Y

15 - 3 / 7 - 20 - 4 - 12 - 25 / 12 - 3 - 4 - 6 / 5 - 20 - 20 - 23 / 1 - 21 - 5 - 20 - 7 / 15 - 25 - 20 / 16
 7 - 3 - 1 - 21 - 5 / 2 - 13 - 21 - 20 - 7 - 22 / 3 - 10 - 15 - 20 - 21 / 25 - 4 - 17 - 20 / 15 - 25 - 7 - 3
 1 - 16 - 25 / 22 - 4 - 21 - 5 - 22 - 15 - 3 - 21 - 20 / 22 - 25 - 4 - 6 - 20 / 4 - 21 - 5 / 6 - 13 - 2 - 2

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22 - 15 - 3 - 21 - 20.

Write the coal fact below:

Answers for Coal Code Detection

TO REACH COAL DEEP UNDER THE GROUND, MINERS OFTEN HAVE TO DRILL THROUGH SANDSTONE, SHALE AND LIMESTONE.

Acknowledgment: Illinois Department of Commerce & Community Affairs and Office of Coal Development & Marketing

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