

**Title:** Uses of Coal

**Level:** Primary, Intermediate

**Time:** 5-7 Days

**KERA Goals:** 2.2, 2.31, 2.33

**Objective:** Students will learn how coal is used as they practice math and language skills.:

**Materials:** Worksheets (below)

**Background Information:** How is coal used?

We use coal in many different ways. One of the most important ways we use coal is to make electricity. Power plants burn coal to produce energy in the form of heat for changing water to steam. The steam turns the blades of a turbine which spins a generator to produce electricity. About half of the electricity in the United States comes from burning coal. We use electricity every day in many ways. Some examples of ways that we use electricity are heating, cooling and lighting our homes and cooking and refrigerating our food. By-products of coal are also used by companies to make items such as steel, cosmetics, and tar.

VOCABULARY: electricity, turbine, generator, valuable, raw materials, chemical, industry

### **Activities**

#### **1. SPELLING DEMONS AND ENERGY**

Much of our energy comes from coal.

#### **2. DINOSAUR LETTER SEARCH**

Energy

#### **3. FIND-AN-ENERGY PHRASE**

Much of the electric power which we use in our homes comes from the energy generated when coal is burned.

#### **4. DINOSAUR LETTER SEARCH**

Fuel

#### **5. ENERGY TRI-A-DESIGN**

Fuel-rock

#### **6. SUM ENERGY WORDS**

Energy

#### **7. THIRD-LETTER SQUARE PHRASE**

Coal is used in the manufacture of many medicines, dyes and plastics.

#### **8. COAL STATE-MENTS**

Most things that use electricity depend on coal.

#### **9. AN A-MAZE-IN PATTERN WORD PUZZLE**

Coal is used as a valuable source of raw materials for the chemical industry.

10. AN OUTLINE TO FIND WORD PUZZLE

Dinosaur letter search

11. COAL = SUM DIFFERENCE

Much energy comes from coal.

12. ZIG-ZAG ENERGY PHRASE

There are over two-hundred-thousand different products made from coal.

**1. A Spell-Well Word Puzzle**

**SPELLING DEMONS AND ENERGY**

Directions:

Decide which of the words are spelled correctly. Begin from the top space on the left and move across each of the word-letter boxes. Place the letters that are above the correct spelling words on the dotted lines. Skip the boxes that have spelling demons (misspelled words). When the exercise is completed, there will be a true energy statement.

Extension: A can be spelled using the letters above the spelling demons.

M BUSY	U GUESS	C WEAR	H EARLY
O THOUGH	D DSOE	F BLUE	O QUITE
U ACHE	R TEAR	E WHERE	I SENCE
N TRULY	E AMONG	R CHOOSE	G WHOSE
N FOURTY	Y USING	C BUILT	O HOAL
O BEFORE	M REALLY	S BELEIVE	E KNOW
S HERE	A ANSER	F COMING	U ALLWAYS
R COUGH	O BEEN	M PRETTY	C MUCH
O NAME	R DOAN	A HALF	L WROTE

M \_ \_ \_ \_ \_ .  
\_ \_ \_ \_ \_

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### Answer to Spelling Demons and Energy

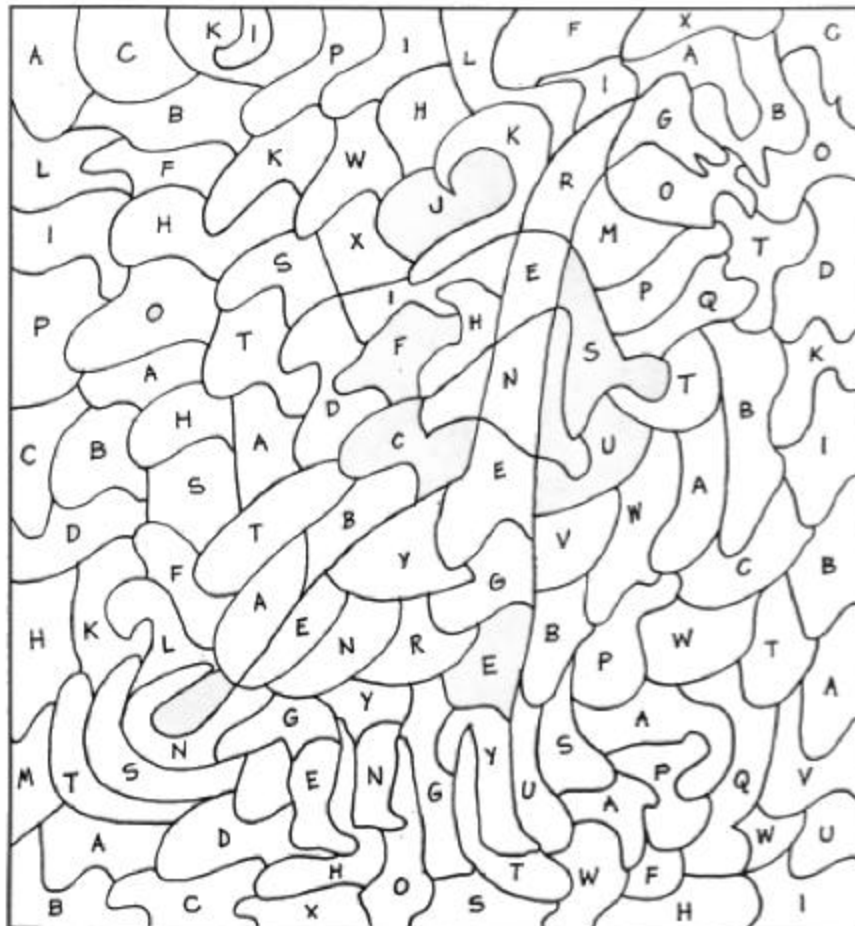
MUCH OF OUR ENERGY COMES FROM COAL

**Extension:** Dinosaur

## 2. An Outline To Find Word Puzzle

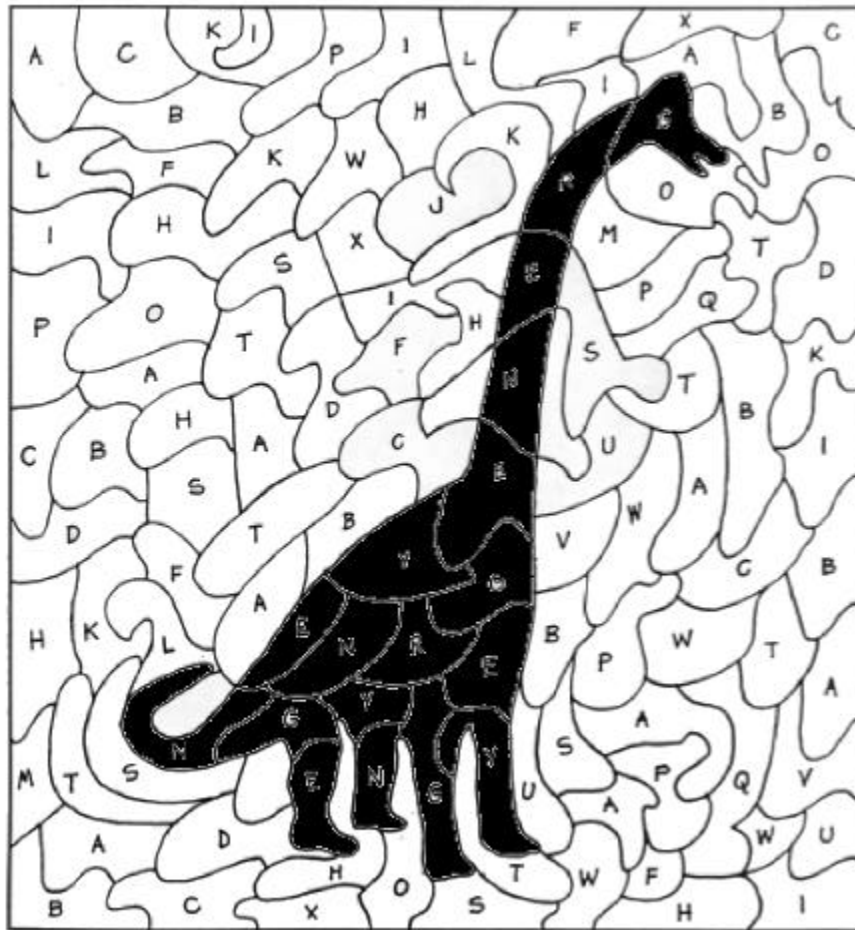
### DINOSAUR LETTER SEARCH

**DIRECTIONS:** Can you find the dinosaur? Color all the shapes in the puzzle which have the letters in the word ENERGY.



ENERGY

Answer to Dinosaur Letter Search



### 3. An A-Maze-In Phrase Word Puzzle

#### FIND - AN - ENERGY - PHRASE

**DIRECTIONS:**

Draw a continuous line connecting the 20 words in the sentence, MUCH OF THE ELECTRIC POWER WHICH WE USE IN OUR HOMES COMES FROM THE ENERGY GENERATED WHEN COAL IS BURNED. Begin from one of the six MUCH words on the outer edges and move forward, either right or left, but never slantwise. There is only one correct route.

THE	ELECTRIC	WHEN	MUCH	OF
OF	POWER	COAL	OF	THE
MUCH	BURNED	IS	THE	WHICH
OF	IS	GENERATED	ELECTRIC	POWER

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WHEN	COAL	ENERGY	WE	WHICH
GENERATED	ENERGY	THE	FROM	THE
OF	THE	ELECTRIC	COMES	ENERGY
MUCH	WHICH	POWER	HOMES	OUR
IN	USE	WE	USE	IN
OUR	WE	WHICH	IN	OUR
HOMES	USE	POWER	BURNED	HOMES
COMES	THE	ELECTRIC	IS	GENERATED
MUCH	OF	POWER	COAL	WHEN
OF	USE	WHICH	WE	USE
THE	WE	WE	WHEN	ELECTRIC
ELECTRIC	POWER	USE	COAL	THE
COAL	OUR	IN	IS	OF
IS	BURNED	OUR	BURNED	MUCH
THE	ELECTRIC	USE	THE	OF
OF	POWER	WE	ELECTRIC	THE
MUCH	WE	WHICH	POWER	ELECTRIC

**MUCH OF THE ELECTRIC POWER WHICH WE USE IN OUR HOMES COMES FROM THE ENERGY GENERATED WHEN COAL IS BURNED.**

Answer to Find-An-Energy-Phrase:

THE	ELECTRIC	WHEN	MUCH	OF
OF	POWER	COAL	OF	THE
MUCH	<b>BURNED</b>	IS	THE	WHICH
OF	<b>IS</b>	GENERATED	ELECTRIC	POWER
<b>WHEN</b>	<b>COAL</b>	ENERGY	WE	WHICH
<b>GENERATED</b>	<b>ENERGY</b>	<b>THE</b>	<b>FROM</b>	THE
OF	THE	ELECTRIC	<b>COMES</b>	ENERGY
MUCH	WHICH	POWER	<b>HOMES</b>	<b>OUR</b>
IN	USE	<b>WE</b>	<b>USE</b>	<b>IN</b>
OUR	WE	<b>WHICH</b>	IN	OUR
HOMES	USE	<b>POWER</b>	BURNED	HOMES
COMES	<b>THE</b>	<b>ELECTRIC</b>	IS	GENERATED
<b>MUCH</b>	<b>OF</b>	POWER	COAL	WHEN
OF	USE	WHICH	WE	USE
THE	WE	WE	WHEN	ELECTRIC
ELECTRIC	POWER	USE	COAL	THE
COAL	OUR	IN	IS	OF

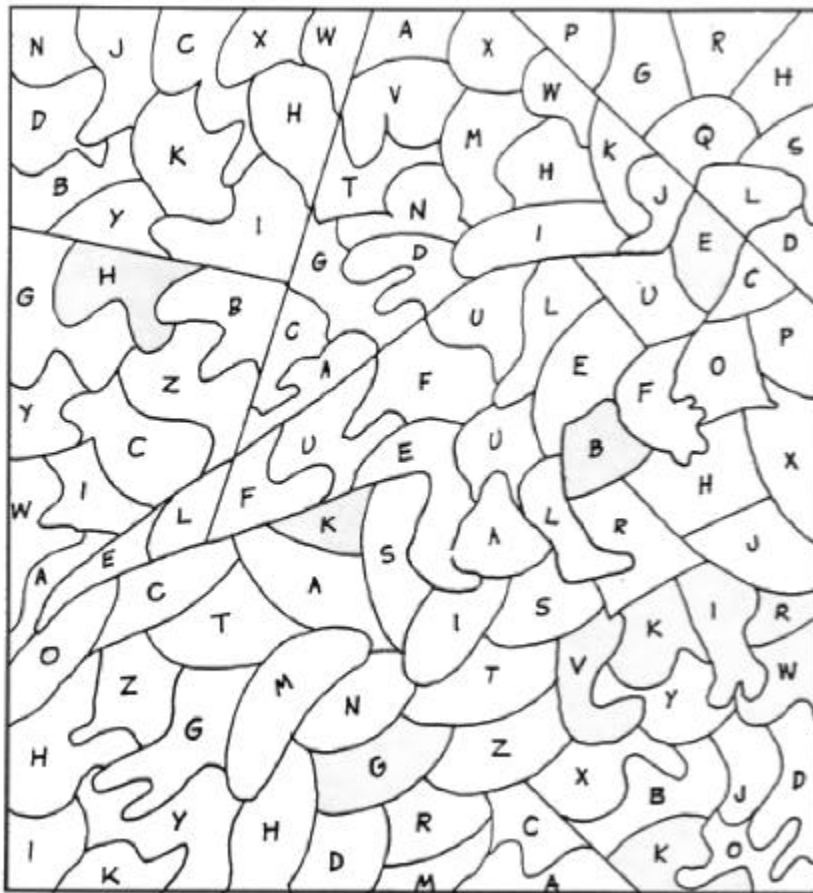
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IS	BURNED	OUR	BURNED	MUCH
THE	ELECTRIC	USE	THE	OF
OF	POWER	WE	ELECTRIC	THE
MUCH	WE	WHICH	POWER	ELECTRIC

#### 4. An Outline To Find Word Puzzle

### DINOSAUR LETTER SEARCH

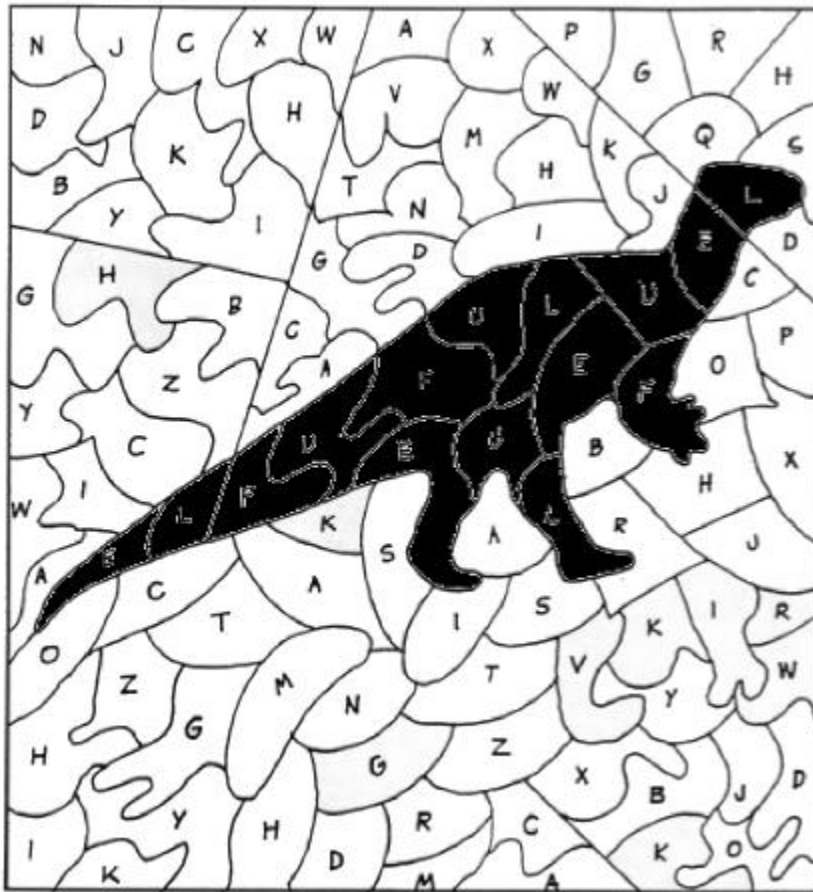
DIRECTIONS: Color the shapes in the puzzle which have letters that are in the word FUEL. After all the correct shapes have been colored, an animal will appear.



**FUEL**

Answer to Dinosaur Letter Search

A Dinosaur will appear.



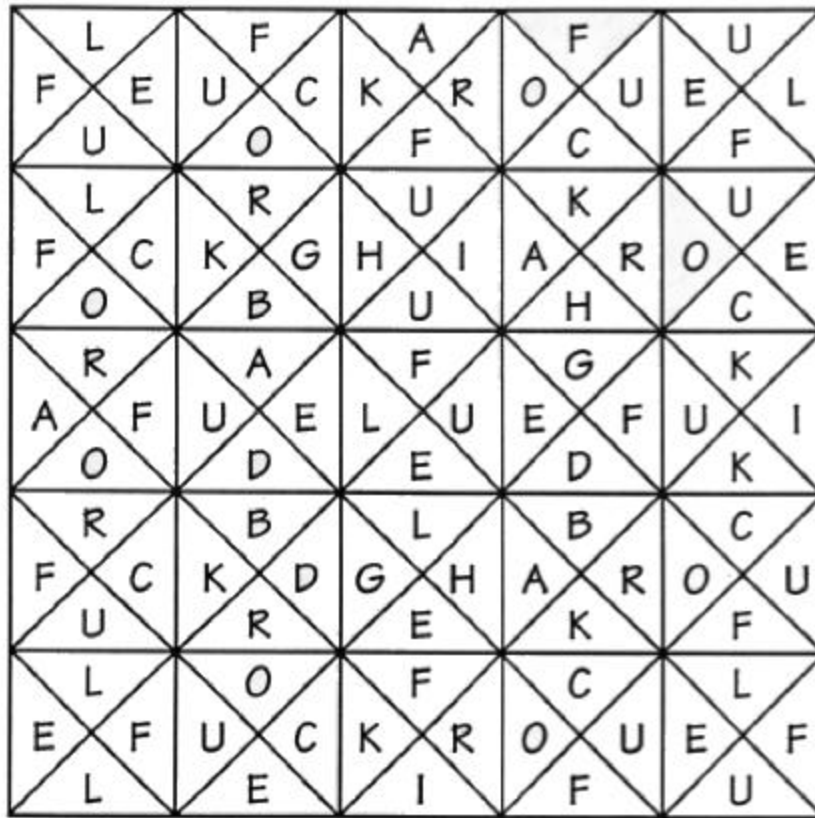
### 5. A Pattern Play Word Puzzle

#### ENERGY TRI-A-DESIGN

Directions:

Color the triangles (3 sided figure) having the letters F - U - E - L one color. Using a second color, color the triangles having the letters R - O - C - K. Color the remaining triangles a third color.

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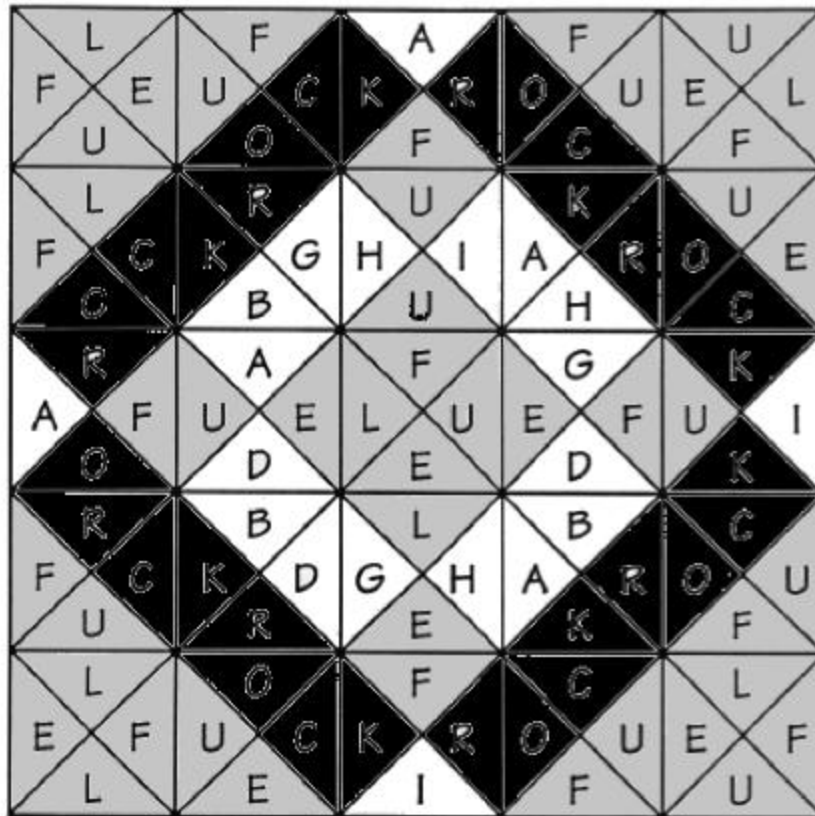


1 2  
FUEL ROCK

Answers to Energy Tri-a-Design.



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TEN

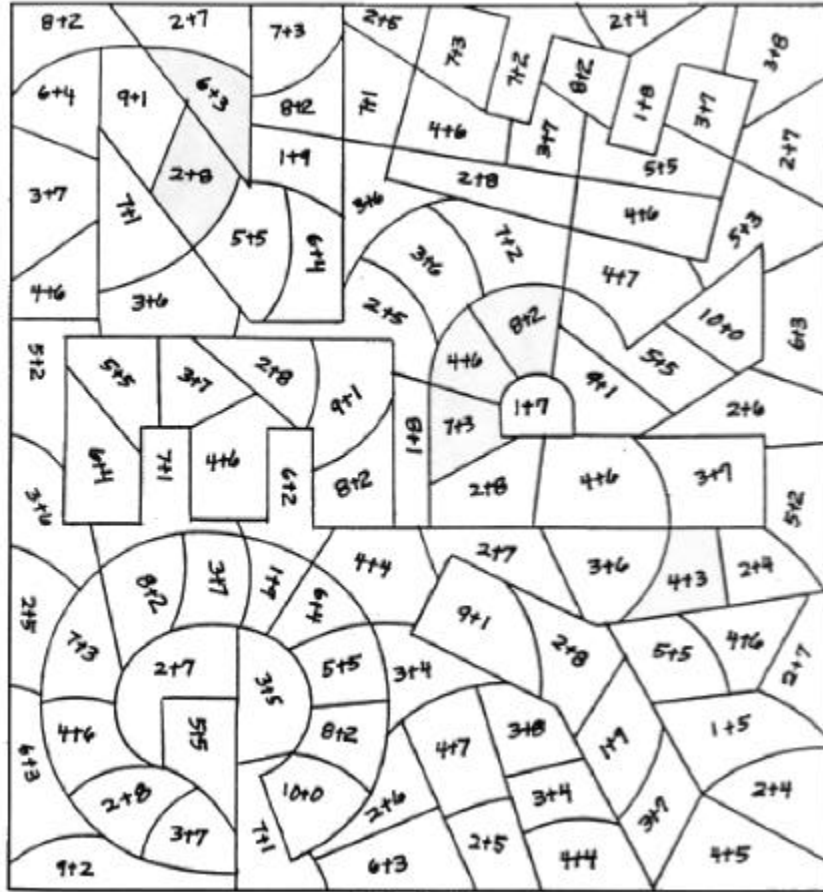
### 6. An Outline To Find Word Puzzle

#### SUM ENERGY WORDS

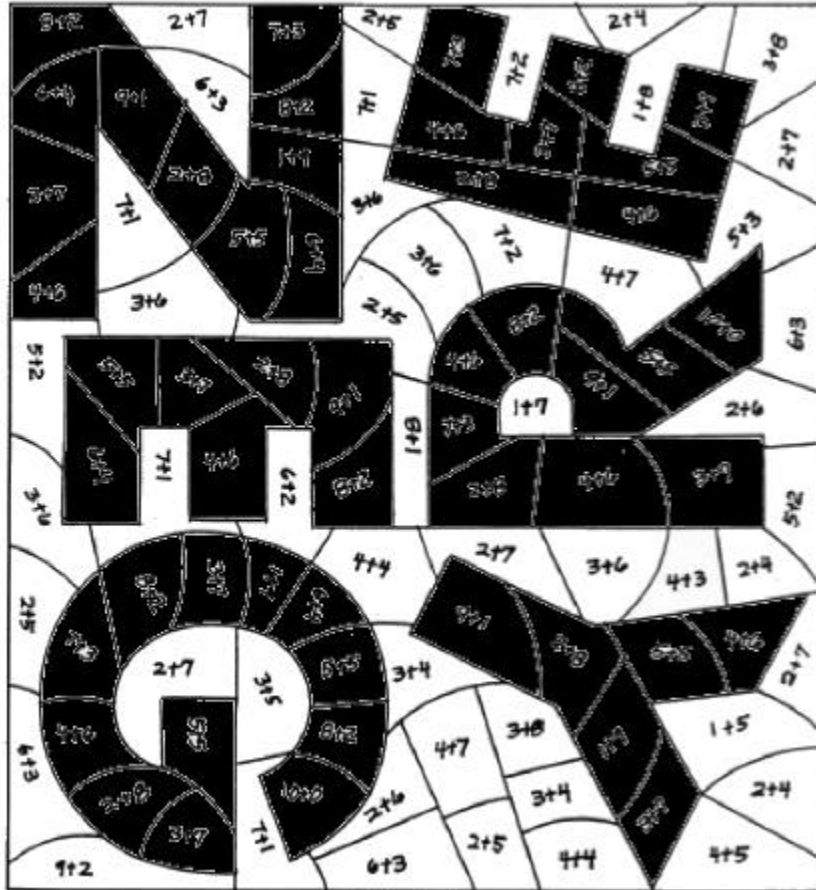
**DIRECTIONS:**

Color or shade each shape which has two numbers with the sum of ten. When the puzzle is colored correctly, six large letters will spell a word.

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ANSWER TO SUM ENERGY WORDS ENERGY



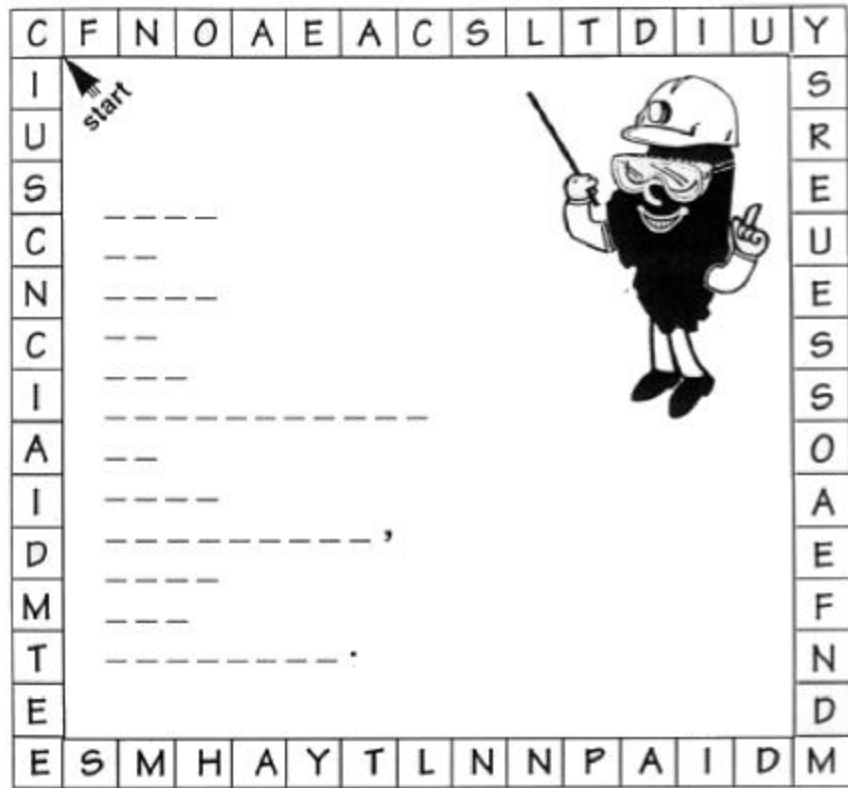
## 7. A Skip Letter Word Puzzle

### THIRD LETTER SQUARE PHRASE

#### DIRECTIONS:

Locate the hidden message. Begin with the letter in the box marked START and move around the large square clockwise, writing every third letter on the dotted lines. The arrow is pointing to the first letter C. To find the second letter, count F-1, N-2, O-3, and write O on the next letter space. Continue around the large square, writing the third letter until all the spaces are filled. What is Mr. Alumpa Coal saying?

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ANSWER to Third Letter Square Phrase:


COAL IS USED IN THE MANUFACTURE OF MANY MEDICINES, DYES AND PLASTICS

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C	F	N	O	A	E	A	C	S	L	T	D	I	U	Y
I														S
U														R
S														E
C														U
N														E
C														S
I														S
A														O
I														A
D														E
M														F
T														N
E														D
E	S	M	H	A	Y	T	L	N	N	P	A	I	D	M

*start*

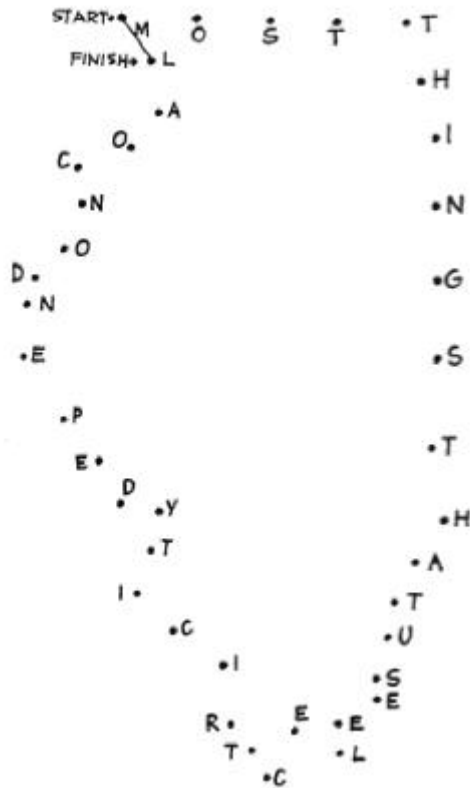
COAL  
IS  
USED  
IN  
THE  
MANUFACTURE  
OF  
MANY  
MEDICINES,  
DYES  
AND  
PLASTICS.



## 8. An Outline To Find Word Puzzle

### COAL STATE-MENTS

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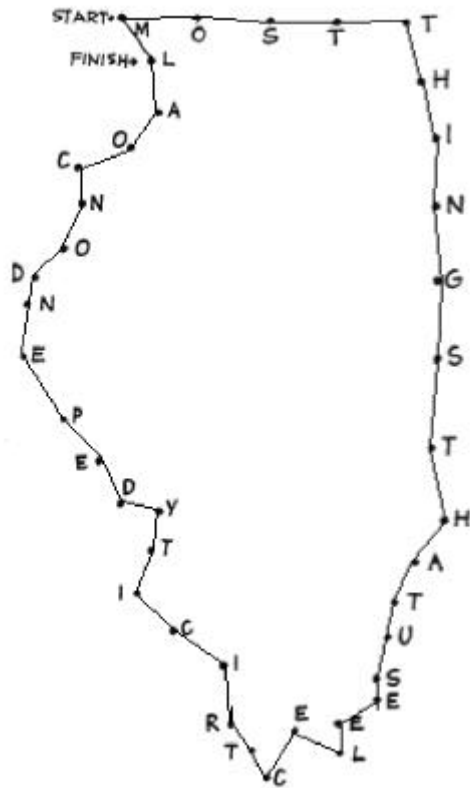
**MOST THINGS THAT USE ELECTRICITY DEPEND ON COAL.  
INDIANA, ILLINOIS, OHIO**

**DIRECTIONS:**

Connect the dots to find a state by tracing the letters that spell the sentence MOST THINGS THAT USE ELECTRICITY DEPEND ON COAL. Begin at the letter M labeled start. and continue spelling the sentence about coal until the final letter L is reached . What state is it?

Answer for Coal State -Ments, ILLINOIS.

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### 9. An A-Maze-In Pattern Word Puzzle

**COAL PATTERN PHRASE**

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**COAL IS USED AS A VALUABLE SOURCE OF RAW MATERIALS FOR THE CHEMICAL INDUSTRY.**

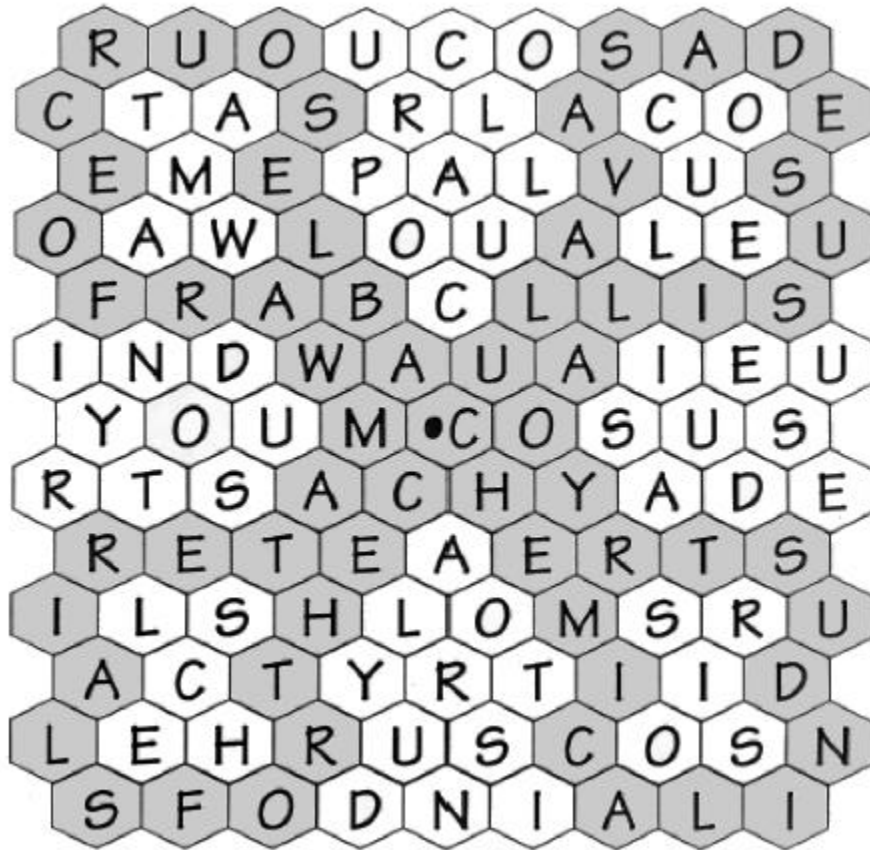
**DIRECTIONS:**

Spell all of the words in the sentence, COAL IS USED AS A VALUABLE SOURCE OF RAW MATERIALS FOR THE CHEMICAL INDUSTRY. Begin at the dot in the middle of the puzzle. Move in any direction to spell the sentence. This is a maze, so a wrong letter route 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 (six-sided figures) that are on that route.

**Answer to Coal Pattern Phrase:**



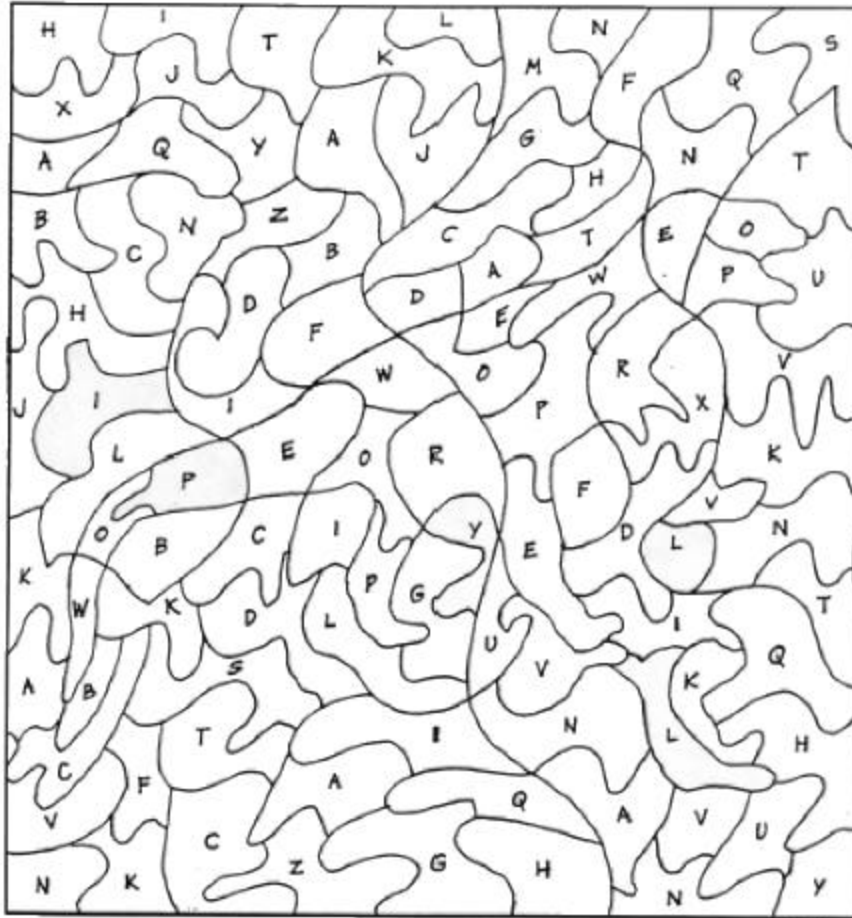
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**10. An Outline To Find Word Puzzle**

**DINOSAUR LETTER SEARCH**

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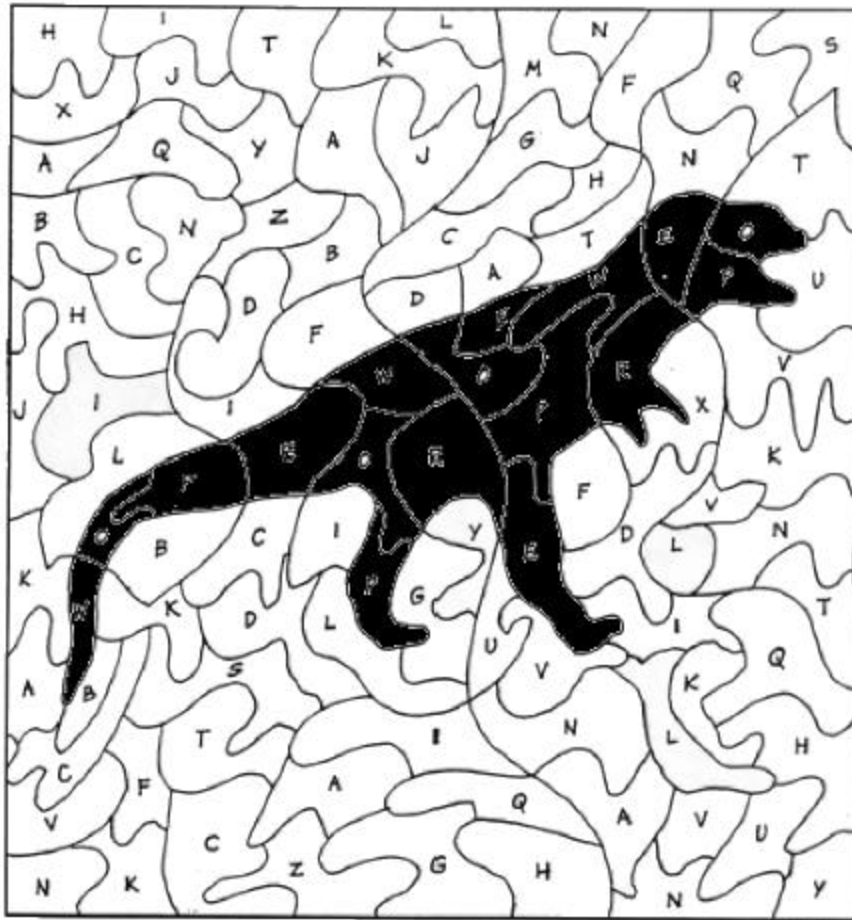


**POWER**

**DIRECTIONS:**

Color the shapes in the puzzle which have the letters that are in the word POWER. After all the correct shapes have been colored, a dinosaur will appear.

**Answer to Dinosaur Letter Search:**



### 11. A Math Code Word Puzzle

**COAL = SUM DIFFERENCE**

**DIRECTIONS:**

Add or subtract the problems and then find the answers in the letter code. Put the letters on the dotted line. For example, an answer of 8 has the letter M in the letter code.

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

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8	3	12	4	10	9	10	
-1	+3	-4	+5	-4	+4	-7	

### LETTER CODE

1	2	3	4	5	6	7	8	9	10	11	12	13	14
Y	H	L	F	S	O	R	M	C	E	N	U	A	G

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**Answers to Coal = Sum Difference**

MUCH ENERGY COMES FROM COAL.

9	7	5	8	1	9	3	10
-1	+5	+4	-6	+9	+2	+7	-3
<b>8</b>	<b>12</b>	<b>9</b>	<b>2</b>	<b>10</b>	<b>11</b>	<b>10</b>	<b>7</b>
8	7	8	9	11	8	6	8
+6	-6	+1	-3	-3	+2	-1	-4
<b>14</b>	<b>1</b>	<b>9</b>	<b>6</b>	<b>8</b>	<b>10</b>	<b>5</b>	<b>4</b>
8	3	12	4	10	9	10	
-1	+3	-4	+5	-4	+4	-7	
<b>7</b>	<b>6</b>	<b>8</b>	<b>9</b>	<b>6</b>	<b>13</b>	<b>3</b>	

### 12. A Six-Way-Move Word Puzzle

#### ZIG-ZAG ENERGY PHRASE



**THERE ARE OVER TWO-HUNDRED-THOUSAND DIFFERENT PRODUCTS MADE FROM COAL.**

**DIRECTIONS:**

This is difficult. Spell all of the words in the energy sentence. THERE ARE OVER TWO-HUNDRED-THOUSAND DIFFERENT PRODUCTS MADE FROM COAL. Use one letter at a time beginning with one of the four letters in an outside hexagon. Move in any direction to spell the sentence. As this is a maze, a wrong letter route can be followed. If this happens, retrace the route and continue locating the remainder of the phrase. There is only one correct route.

Hint: Start at the second T on the far left.

**Answers to Zig-Zag Energy Phrase**

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

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