MINING

UTAH'S HERITAGE

THE STORY OF UTAH MINING

TABLE of CONTENTS

ABOUT THIS WORKBOOK - 'Let's go Mining' 1

UNIT 1

MINING - We Depend On Mining Every Day 3
HISTORY - Do You Know the History of Utah Mining? 5
SAFETY - OLD MINES ARE DANGEROUS! 7

UNIT 2

MINING - Where are Utah's Minerals? 9
HISTORY - Meet Some Famous Miners 11
SAFETY - DANGERS LURK AT OLD MINES! 13

UNIT 3

MINING - Look Inside an Underground Mine 15
HISTORY - How Did Carbon County Get Its Name? 17
SAFETY - OLD DYNAMITE CAN BLOW UP! 19

UNIT 4

MINING - Surface Mines are Replanted 20
HISTORY - Can you find Utah mining towns? 21
SAFETY - STAY AWAY FROM OLD MINE SHAFTS!. 23

UNIT 5

MINING- Minerals You Use Everyday: Stuff in my Room 25
HISTORY - Significant Events in Utah's Mining History 26
SAFETY - ATVs AND ABANDONED MINES DON'T MIX! 27
Where are Utah's Abandoned Mines? 28

ABOUT US - Who We Are and What We Do 29
FIND OUT ABOUT UTAH MINING! 30

This work book has been designed to address and enhance Fourth Grade Social Studies Core Standard 1, Objectives 2 and 3 as well as Core Standard 2, Objectives 1, 2 and 3.

Welcome!
I'm Mr. Mine.
Come take a trip
with me as we learn
the importance
of mining.

LET'S GO MINING

Mining is the way we get minerals like gold and silver from the earth. Big machines move a lot of earth to mine. Drying salt from the Great Salt Lake waters and pumping oil from wells are mining also. After minerals are mined, they are cleaned, then moved to places where they are made into skateboards, jewelry, bicycles and other useful things. When miners are finished mining, they clean up the land so it can be used again.

Mining has been important in Utah for a long time. It created jobs and towns and cities. People came from all over the world to work in mines. This kind of history is called heritage.

Thousands of old mines were not cleaned up when mining stopped. Utah closes these abandoned mines and cleans up the land, but some dangerous mines are still in the mountains and deserts. People get hurt exploring them, so stay away!

UNIT 1

We depend on MINING

Every day!

Mining products are all around us. Parts of your house come from a mine. So do many things in your classroom such as your desk and chalk.

On this page, begin your travel through the mine. Look for objects that come from mining. They are things you need in your house and classroom. The minerals used to make them are also listed. Minerals have funny and different names. Say them out loud and then answer the questions below.

iron, zinc, copper

clay, iron

chromium, nickel, iron

coal, steam, oil (petroleum), gas, uranium

copper, molybdenum, trona

trona, silica, sand, feldspar

clay, gilsonite

limestone, clay, shale

gallium, germanium, gold, silica, beryllium, copper, oil

What minerals are already familiar to you?

List minerals that begin with the letter "G"

What mineral do you play with at the beach?

What mineral is funny for you to say out loud?

What mineral has the same name as a five cent coin?

What is another word for oil?

HISTORY

We mine things that we cannot grow. Decide which items in each section are mined. Mark the boxes next to them. In the spaces below, draw or paste pictures of things made from mined materials.

FARMING:

FARMERS USE:

( ) fertilizer
( ) irrigation systems
( ) grain
( ) tractors

CONSTRUCTION:

CONSTRUCTION WORKERS USE:

( ) concrete
( ) tools
( ) bricks
( ) gloves
( ) lunch buckets
( ) hard hats

TRAVEL:

TO TRAVEL AROUND THE WORLD AND INTO SPACE, WE USE:

( ) seatbelts
( ) trucks
( ) trains
( ) freeze-dried food
( ) rocket ships
( ) cars

MUSIC:

TO PLAY MUSIC, WE USE:

( ) drumsticks
( ) French horns
( ) cymbals
( ) trumpets

GAME!

ANSWER the questions after each story!

Utah's first miners

American Indians, Mexicans and Spaniards mined before Mormon pioneers arrived in 1847. Mormons mined coal to heat their homes and lead to make bullets. They mined iron to make farm tools, pots and pans, and nails.

1. Mormon pioneers mined iron to make:
   ( ) heat
   ( ) farm tools
   ( ) bullets

Mines sprang up all over Utah

Utah mining grew rapidly after the railroad was finished in 1869. Rail cars carried minerals to many places to be sold. In the 1890s, coal mining became important in Carbon County. By the early 1900s, silver and copper were Utah's most important minerals. A uranium boom started in the 1950s.

As mines were discovered, towns were built around them. Many started as mining camps. Today Alta is a famous ski resort, but 100 years ago it was a mining town. Some of these towns did not last very long and became ghost towns where no one lives anymore.

You still can see old mines in Big and Little Cottonwood canyons and in the Oquirrh Mountains near Salt Lake City. There are also old mines near Park City and at Silver Reef near St. George.

2. What mining town became a ski resort?
   ( ) St. George
   ( ) Mercur
   ( ) Alta

Mining created jobs for immigrants

People came from all over the world to live in Utah. These people are called immigrants. Some immigrants worked in the mines. Others ran grocery stores, restaurants and businesses in mining towns. Most immigrants did not speak English.

Often the immigrants lived in neighborhoods with people from their countries. In Salt Lake City, there was a Chinatown and a Greektown. There were neighborhoods of Italians, Japanese, Armenians and other nationalities.

3. Have you ever eaten a taco? _____, a gyro? _____, sushi? _____, spaghetti? _____.
   What nationalities brought these foods to our country?
   _____

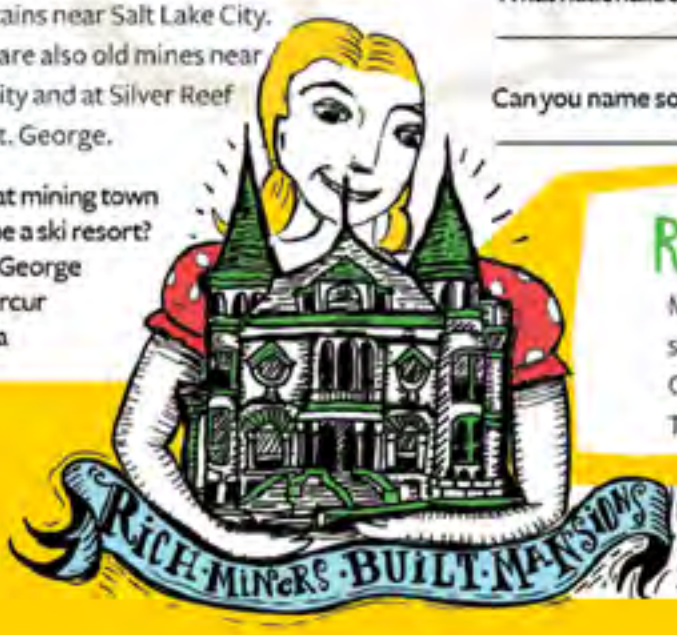
   Can you name some other foods the immigrants brought?
   _____

TO DO:

Next time you are in Salt Lake City, go to South Temple Street and see the mansions. Which one do you think the Governor lives in?

Rich miners built mansions

Mining made a few people rich. These people built mansions, skyscrapers and hotels. Many of the mansions on Salt Lake City's South Temple Street were built with mining money. The governor lives in the Kearns Mansion.



OPTIONAL EXTENDED LEARNING:
Ask about YOUR HERITAGE. Which states and countries did your parents, grandparents and great-grandparents come from?

Color the Picture.

Game!!!

What is the secret message in this word game? Unscramble the words below. Write one letter in each square. The letters will make seven words about old mines. You can find all the words in the story.

1. ILDELK
L

2. AGREND
R

3. TBERAHE

4. IOOSUNPOS
N

5. ANBDEOAND
B

6. URHT

7. LSOT

Do you like to go exploring? Most of us do! But exploring old mines can be dangerous. Children and adults have been hurt or killed at old mines.

Utah has many deserted mines. Some of these mines have not been used for many years. There is not much to see in an abandoned mine, but there is a lot of danger.

Some mines look like a cave in the side of a mountain. There are many dark tunnels in the mines. The roofs of the mines are held up by old pieces of wood. Sometimes the wood breaks and the roof falls in. If you are in a mine when this happens, you can be hurt or even killed.

Fires are often burning in underground mines. They burn up the oxygen you need to breathe. These fires spread quickly and release deadly gases.

You can get lost in the dark tunnels. Even miners have gotten lost while working in underground mines.

Some mines contain poisonous gases. These gases take the place of oxygen you need to breathe.

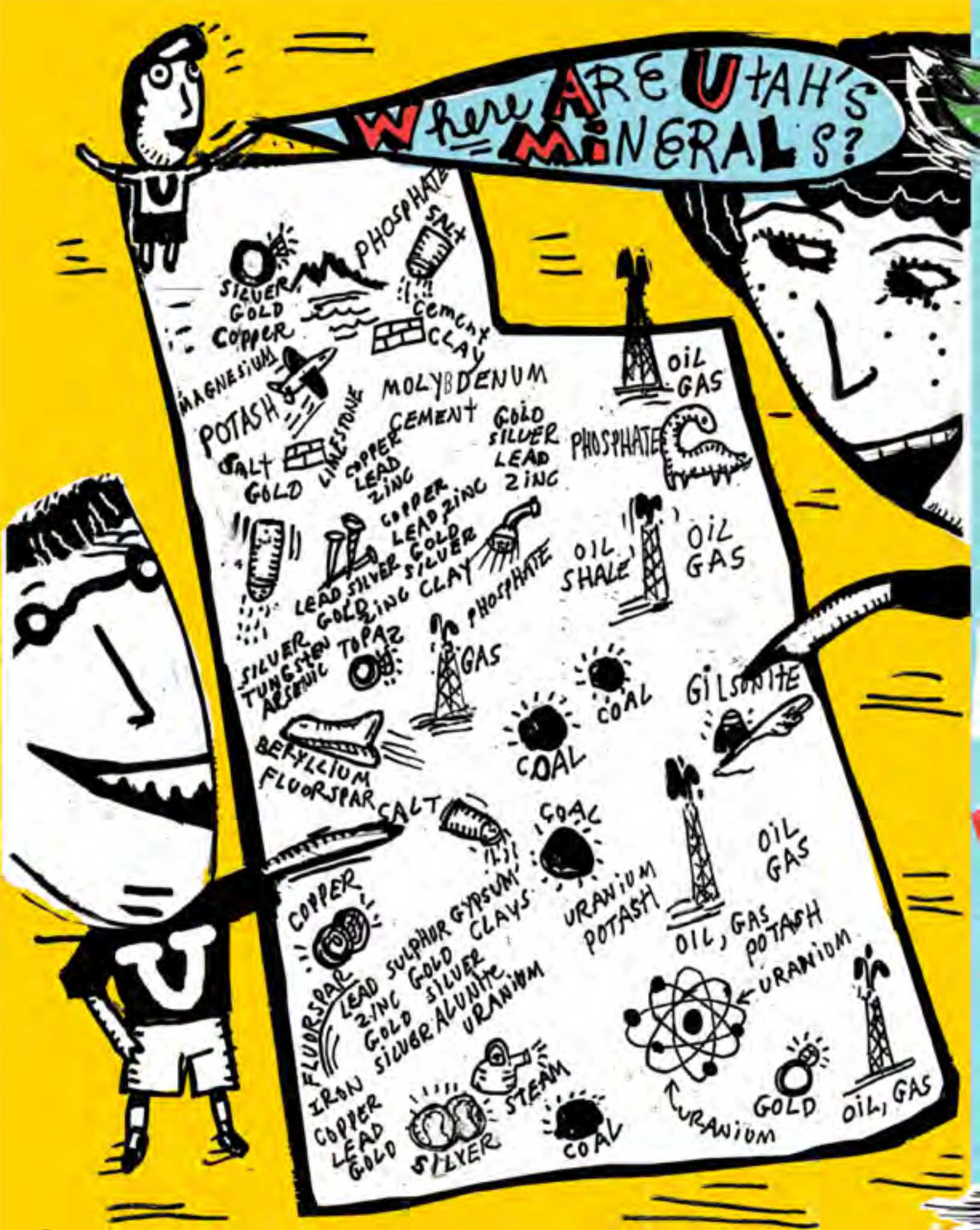
Snakes, spiders, scorpions, and poisonous insects live in old mines. These dangerous creatures can bite or sting you.

To be safe, STAY OUT OF OLD MINES!

Now find the secret message. The circled letters spell a message for you about old mines. Write the letters in the boxes below.

OPTIONAL EXTENDED LEARNING: Think of some things you would do to survive if you were trapped in an old mine, or draw some dangerous creatures which are found in abandoned mines.

Where Are Utah's Minerals?



WORD·MINE

UNIT 2

The answers to this cross-word puzzle are in the WORD MINE. They are also on the map. Can you find them?

Solve it ORE* else! *ORE = Any material that can be mined and sold.

Across

1. This metal is very heavy.
4. This metal hardens steel and has a funny name.
7. Miners rushed to Utah in 1892 to mine this metal.
8. This mineral is mined from the Great Salt Lake.
9. This mineral is used to make bricks and ceramics.
10. This gem looks like a diamond.
13. This metal is radioactive.
14. This metal is the main ingredient in steel.
15. Pennies are made from this metal.

Down

2. Fossils of these are found in Utah.
3. This rock burns and is used in power plants.
5. This rare metal is used in the space program.
6. Geothermal water produces this gas.
7. This shiny, black mineral is used to make records and other plastics.
11. This metal rhymes with sink.
12. Park City, Alta and Eureka are famous for this metal.

OPTIONAL EXTENDED LEARNING: There are other minerals mined in Utah; gypsum, oil shale, arsenic, potash and fluorspar. Find out what things are made from these minerals.

Meet Some Famous Miners

Game!

These people were some of the first miners in Utah. First, read about what they did. Then, match their names with their contributions.

Chief Tintic was a Ute Indian. The Tintic Mining District was named after him. He knew the value of silver in the area where he lived.

Patrick E. Connor is called the Father of Mining in Utah. He was an Army colonel who helped start Fort Douglas. He and his soldiers started many silver mines in Utah.

The McIntyre Brothers were cattle ranchers. They traded their herd for the Mammoth Mine in the Tintic Mining District and struck it rich.

Samuel Newhouse is called the Father of Copper Mining in Utah. He found rich copper ore more valuable than gold and later built Utah's first copper smelter.

Famous Miner		Contribution
1. Chief Tintic	☐	a. Father of Mining in Utah
2. Patrick E. Connor	☐	b. First copper smelter
3. McIntyre Brothers	☐	c. Knew the value of silver
4. Samuel Newhouse	☐	d. Developed the Mammoth Mine

Mary Harney Judge

gave much of her Park City mining fortune to private charities. One project was a hospital for sick and aging miners. The hospital is now Judge Memorial High School in Salt Lake City.

Susanna Egeria Bransford Emery Holmes Delitch Engalitcheff

was know as UTAH'S SILVER QUEEN! She became wealthy when the first of her four husbands discovered silver. She lived the lavish lifestyle of the rich and famous.

Thomas Kearns and David Keith

made their fortunes at the Mayflower and Silver King Mines in Park City. Both built mansions in Salt Lake City on Brigham Street, now South Temple Street. The Governor of Utah now lives in the Kearns Mansion.

Charles A. Steen

made a fortune when he discovered a rich uranium deposit near Moab. Uranium is used for nuclear energy. Steen named his uranium mine MI VIDA, which is Spanish for 'My Life'.

Famous Miner		Contribution
5. Susanna Engalitcheff	☐	a. Judge Memorial High School
6. Kearns & Keith	☐	b. Silver Queen
7. Mary Judge	☐	c. Made a fortune in uranium
8. Charles A. Steen	☐	d. Brigham Street mansions

Optional Extended Learning

Tell which famous miner you most admire and why. Or draw a picture of this person!

OLD BUILDINGS NEAR ABANDONED MINES ARE DANGEROUS. Wood in the old buildings is rotten. It can break and fall on you. You can fall through floors or stairs. There are old machines and trucks around old mines. They have sharp, rusty edges which can cut you. Stay away!!

Game!!

Can you find your way from the abandoned mine to your home? Do not run into any old buildings, rotten timber, rusty equipment or dangerous mine openings.

Optional Extended Learning Can you think of other safety messages?

LOOK INSIDE an UNDERGROUND Mine

UNIT 3

Game!

Connect the dots to see a mine. The words are parts of an underground mine. Study them and learn what they mean.

Optional Extended Learning

Do you know anyone who works at a mine? What is the person's job?

Ore Body
A part of the earth that has minerals in it. Color it gold or silver.

Ore
Minerals that can be mined and sold. Find the ore car and color the ore inside gold or silver.

Headframe
A headframe has an elevator used to move people, ore and tools in and out of the mine. Circle the headframe.

Portal or Adit
A horizontal entrance to a mine. Can you find it? There is a picture of an abandoned adit on page seven.

Shaft
A vertical tunnel that goes from the ground down into a mine.

Face
The place where the ore body is broken and removed.

HOW Did CARBON COUNTY Get its NAME?

ONCE there were 23 coal mining camps in one of Utah's counties. Because coal is made of carbon, the county was named Carbon County.

GAME

1. + S = _ _ _ _ _

2. P + D + less = _ _ _ _ _ _ _ _

3. - P + T = _ _ _ _ _

4. - UT + = _ _ _ _ _ _ _ _

5. + + yon = _ _ _ _ _ _ _ _ _ _

6. + = _ _ _ _ _ _ _ _ _ _

7. + + - L = _ _ _ _ _ _ _ _ _

8. LA LA LA + 2 + DA = _ _ _ _ _ _

Can you find all the coal camps on the Carbon County Map?

Solve the picture puzzles to make the coal camp names. Write the names next to the picture puzzles.

OLD DYNAMITE CAN BLOW-UP!

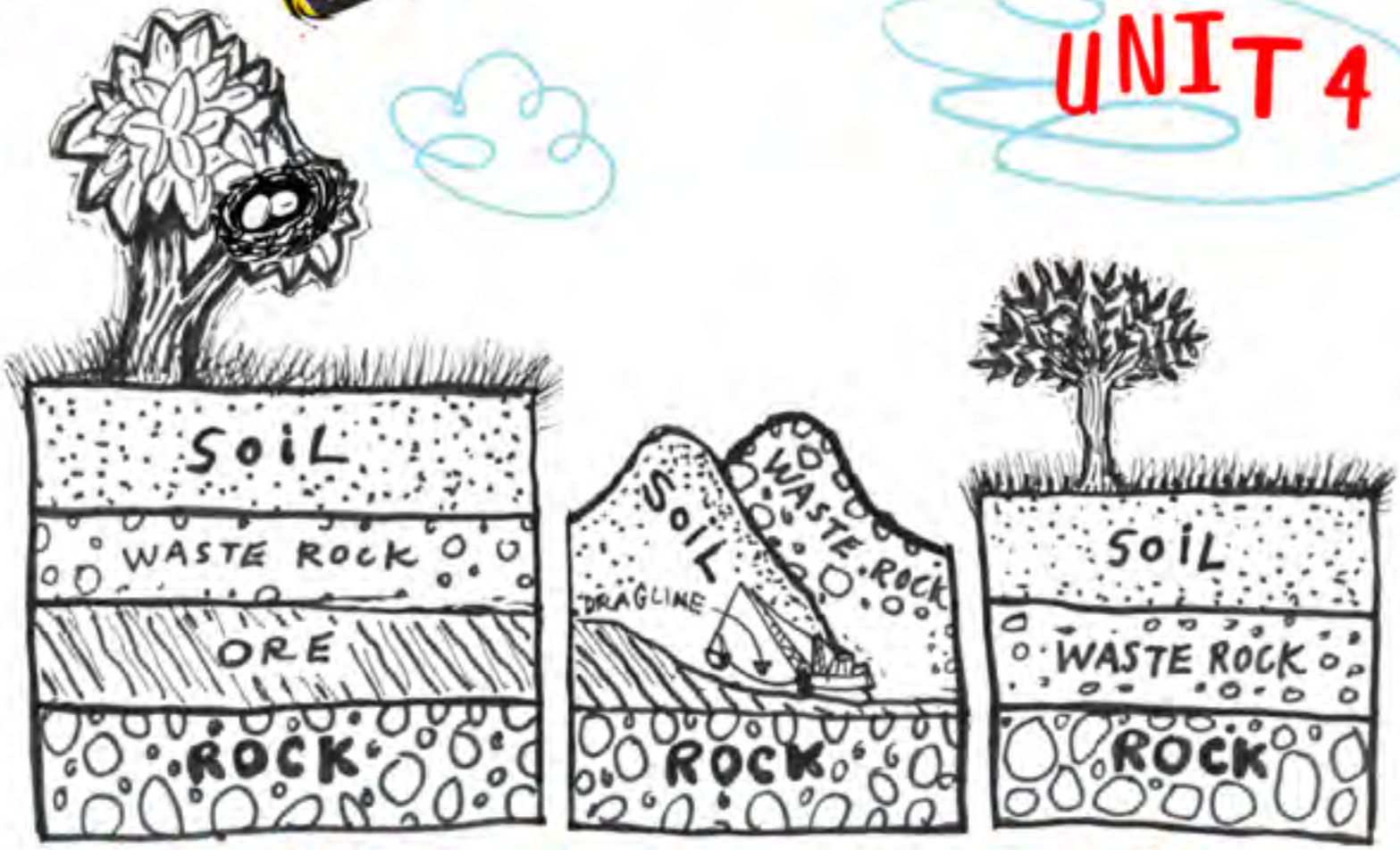
EXPLOSIVE MATERIALS are found near abandoned mines. Explosives can blow up and hurt you!

First connect the dots. Then, unscramble the word to see whom to call.

If you find something that looks like these pictures,

SURFACE MINES ARE REPLANTED

UNIT 4



Before Mining During Mining After Mining

Game!

Did you know that?

1. After mining, the soil is replaced and the land is replanted with grass and trees. This is called RECLAMATION. Color the replanted land green or draw flowers on the diagram.

2. Twenty-five people can fit into a dragline bucket. Find it and draw a circle around it.

3. Mining companies hire wildlife experts to move hawk nests out of the way of mining. Find the hawk's nest and move it.

4. KENNECOTT'S BINGHAM CANYON MINE in the Oquirrh Mountains is so large, it can be seen from space!

GAME

CAN YOU FIND UTAH MINING TOWNS?

A	H	T	A	W	A	I	H	X	E	B	I	E
H	T	O	M	M	A	M	G	O	A	T	L	A
R	I	H	P	O	L	L	I	H	D	L	O	G
A	N	O	Y	N	A	C	G	N	I	R	P	S
R	O	L	A	P	P	P	E	V	A	L	E	F
D	C	A	D	R	A	Z	D	S	N	I	A	R
L	V	U	D	E	E	R	C	R	E	E	K	I
E	U	R	E	K	A	R	K	L	A	Y	I	S
I	E	N	D	D	O	T	A	C	Y	G	Z	C
F	B	W	N	M	I	H	T	S	I	T	O	O
O	B	A	S	I	N	E	N	D	E	T	T	N
C	T	M	U	T	U	A	L	P	L	G	Y	X
S	E	L	L	I	V	L	A	O	C	J	O	Y

The names of 22 Utah mining towns are hidden in the letters to the left. They are written in different directions. Some are even backwards. CIRCLE THE LETTERS THAT MAKE A NAME. Two names are circled for you!

Optional Extended Learning

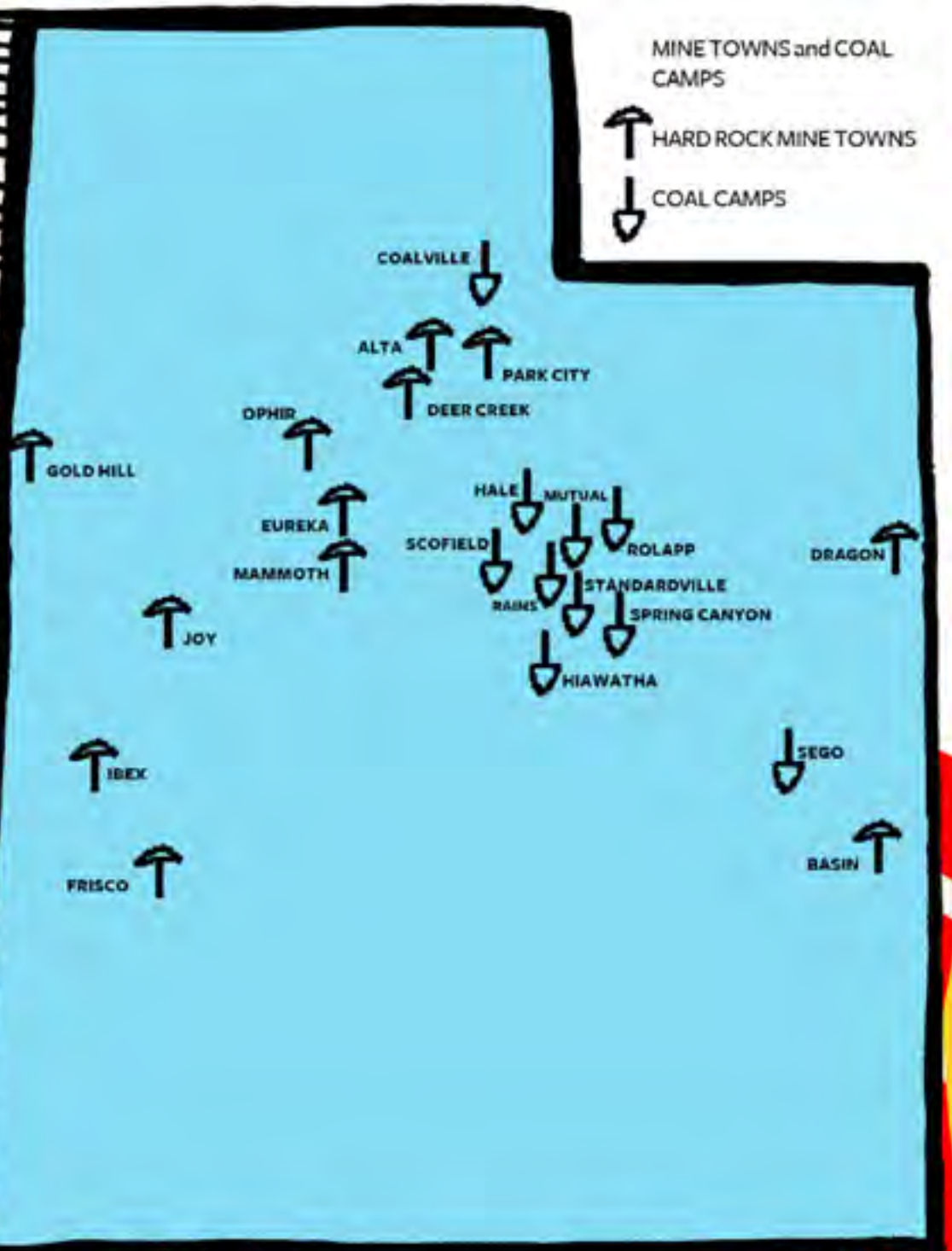
Write a story or tell a classmate about living in a coal camp or hard rock mining town, or draw a picture of what you think the town looked like.

GAME 2.

See

DIRECTIONS

See the two different symbols by the town names on the map. Coal is a "soft" rock mineral and is shown by this symbol ↓. Gold and silver are "hard" rock minerals and are shown by this symbol ↑. Look on the map to find if the town is a coal camp or a hard rock mine town.



Draw the symbol next to the name.

1. _____ Alta
2. _____ Basin
3. _____ Coalville
4. _____ Deer Creek
5. _____ Dragon
6. _____ Eureka
7. _____ Frisco
8. _____ Gold Hill
9. _____ Hale
10. _____ Ibex
11. _____ Joy
12. _____ Hiawatha
13. _____ Mammoth
14. _____ Mutual
15. _____ Ophir
16. _____ Park City
17. _____ Rains
18. _____ Rolapp
19. _____ Scofield
20. _____ Sego
21. _____ Spring Canyon
22. _____ Standardville

STAY AWAY

FROM OLD MINE SHAFTS!

SOME ABANDONED MINES

- Are just big and deep holes in the ground!
- Are as deep as the Empire State Building is tall!
- Are death traps for people who crawl inside to explore!
- Are unstable and the sides or roof can cave in on you!

STAY OUT and STAY ALIVE

OLD MINES ARE DANGEROUS!

Game!

Match each picture with the correct sentence. Fill in the blank spaces.

1. It is fun to hike and ski in the _____, but be sure you know there are no abandoned mines close by.

2. When you ride _____ in the snow with your family, be sure the area is safe.

3. A mining shaft is shown on a special map by this symbol ___.

4. _____ in the winter is fun and safe if your stay on groomed trails.

5. Stay on the trail when you are _____ or backpacking in the mountains where there could be abandoned mines.

6. When you ride your _____ in the summer, be sure to wear a helmet and watch where you go.

7. Take only _____, leave only footprints.

OPTIONAL EXTENDED LEARNING

Draw pictures or write about fun things you like to do outdoors. Tell or show how you do these things safely.

Find What Minerals You Use Every Day!

COLOR THE ITEMS from the list below - Notice what minerals we use everyday.

SKATEBOARD - graphite, aluminum
DESK - copper, iron
LAMP - tungsten, zinc
COMPUTER - gold, copper
MP3 - copper, gallium
HELMET - petroleum

WATER BOTTLE - aluminum, iron
TV - silica, iron
LIP BALM - petroleum
SAXOPHONE - silver, copper, tin
CARPET - limestone, selenium
VIDEO GAME SYSTEM - gold, copper

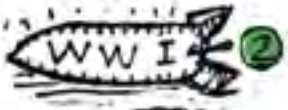
DIGITAL ALARM - quartz, gold
CELL PHONE - arsenic, platinum
MIRROR - silver, silica
TENNIS RACKET - aluminum, graphite
WINDOW - feldspar, iron
CLOTHING - boron, halite

Significant Events in Utah's Mining History

PUT the PICTURE NUMBER in the correct sentence (hint: read the words in all capitals in each sentence) then, place the correct PICTURE NUMBER in the circle under the correct year ON THE TIME LINE at page bottom (hint: each year is mentioned in each sentence). HAVE FUN!

UNIT 5

1



2

3

4

5

6

7

8

9

In 1862 soldiers began to mine in the Bingham Canyon area. Digging with PICK AXES, they found gold and silver in Park City and Eureka and the Utah gold rush was on. ( )

May 10, 1869, near Promontory Summit the GOLDEN SPIKE was driven, completing the transcontinental railroad. Large mining equipment could now be easily brought to Utah. Many small mines became big corporations as investors from all over the world began developing Utah's mining industry. ( )

Carbon County coal was sold all over the west after the completion of the DENVER & RIO GRANDE WESTERN RAILROAD in 1883. Coal mining is still one of the most important industries in Utah. Immigrants came from all over the world to work in the Utah mines. ( )

In 1896 the copper mine in Bingham Canyon started. Smelters around the Salt Lake Valley provided copper which was in growing demand as the country got electricity. Today the UTAH KENNECOTT COPPER MINE is one of the largest open pit mines in the world. ( )

In the early 1900s in France, MADAME MARIE CURIE discovered radioactivity. She traveled to Temple Mountain in Emery County, Utah, to visit the source of rich ore she used in her experiments. ( )

In 1914 WORLD WAR I increased the demand for vanadium, which was used as a steel-hardening agent for military equipment, and radium was used as an illumination agent for watch faces, compasses, gun-sights, and airplane dials. ( )

During World War II the US government ran a huge secret research project and ALBERT EINSTEIN discovered how to unleash the power of the nuclear bomb. In 1945, we used it on Japan to end the war. ( )

Uranium became a key part of the nation's security after CHARLIE STEEN discovered uranium near Moab in 1952. Since the government offered such high prices for uranium, thousands of people came to Utah hoping to make their fortunes. ( )

In 2010 Utah was the #3 STATE in mineral production in America. Did you know that 80% of the world's beryllium comes from Juab County? Beryllium is used to make electronic circuitry for smart phones and music players because it conducts heat so efficiently. ( )

Write the number of the correct icon in each circle below.

1862 ------- 1869 ------- 1883 ------- 1896 ------- 1900 ------- 1914 ------- 1945 ------- 1952 ------- 2010

( ) 1st miners use pick axes

( ) Golden Spike completed RR

( ) D & RG

( ) Bingham Cyn Mine

( ) Madame Curie

( ) WWI

( ) Albert Einstein

( ) Charlie Steen Moab

( ) Utah #3 mineral producing state

Most popular ATV trails like the Paiute Trail and the White Rim Trails were originally old mining roads. The miners are long gone, but the mines they dug are still around. Don't let a mine be the end of your road.

LEARN TO RECOGNIZE MINES!
Most have classic fan-shaped waste rock dumps and roads or trails leading to them. Not every mine has a dump because some shafts were dug from the bottom up.

DON'T CLIMB MINE DUMPS WITH YOUR ATV!
Don't climb a steep rocky slope unless you know what is on the other side! It might be a deep hole that goes straight down. Not the kind of air you want to catch - the bigger the dump, the deeper the hole.

STAY OFF OF MILL TAILINGS!
Mill tailings have heavy metals in the dust that are toxic to breathe or track home with you.

KEEP A SAFE DISTANCE
Edges of mine shafts are often unstable. Whether on foot or ATV, stay back from the edge. It could crumble beneath you!

RESPECT PRIVATE PROPERTY
Most abandoned mines are private property. Don't trespass - don't steal - and don't vandalize!

KNOW BEFORE YOU GO
Check your map for mines before you set out. Most maps show only the largest mines in an area. Usually many more mines are found on the ground.

LEARN THESE MAPS SYMBOLS FOR MINES.

Why don't all mines have waste rock dumps? _____

The _____ **the dump, the deeper the** _____.

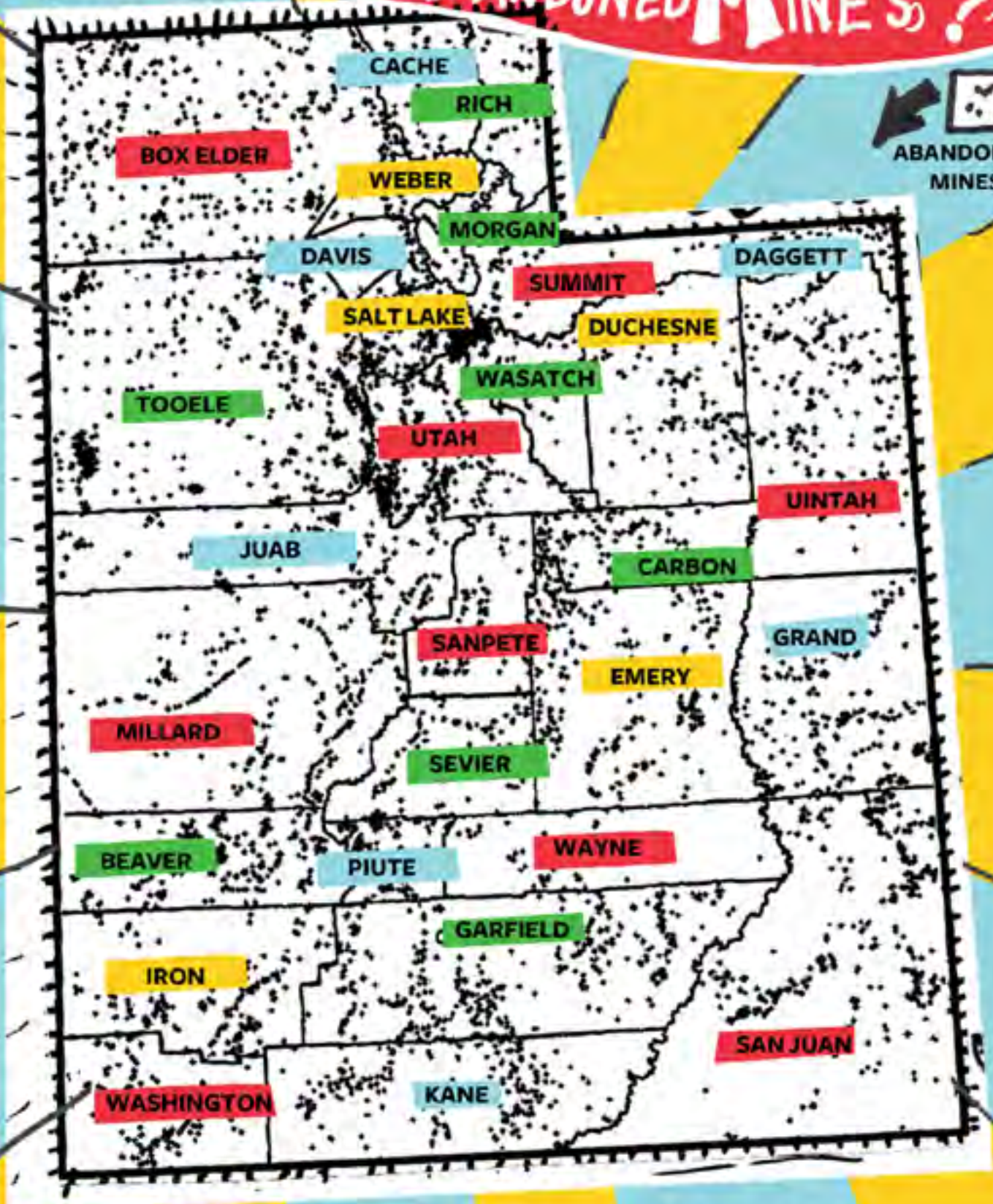
Mill tailings may contain heavy metals that are hazardous to breathe. TRUE / FALSE

The ground around a mine shaft is often _____.

Maps will have mine symbols for every mine in the area. TRUE / FALSE

Most abandoned mine land is _____ _____.

Where Are Utah's Abandoned Mines?



It is estimated that there are 17,000 abandoned mines in Utah. They are located in every county.

Who we are

We are environmental scientists and technicians who figure out how to make abandoned mines safe and environmentally stable. We are geologists, mining engineers, hydrologists, realty experts, biologists, geographers and botanists.

What we do

We find, characterize, map, and analyze abandoned mines, and engineer and design construction projects to fix problems. We evaluate environmental impacts of abandoned mine work on endangered species, birds, bats, water supplies, vegetation, erosion, history, and archeology and then design projects that eliminate hazards by safeguarding open abandoned mines.

Why we do it

FEDERAL LAW - Public Law 95-87, Surface Mining Control and Reclamation Act of 1977, created abandoned mine programs funded by a tax on coal production.

Web Links

Utah Mining Association: http://www.utahmining.org/brochure.htm

History of Coal Mining in Utah: http://www.onlineutah.com/miningcoal.shtml

History of Mining in Utah: http://www.miningutah.com/index.html

Utah Abandoned Mines: http://www.blm.gov/ut/st/en/prog/more/Abandoned_Mine_Lands.html

Utah Division of Oil Gas and Mining: http://www.ogm.utah.gov/

Mine Safety and Health: http://www.msha.gov/kids/kidshp.htm

Minerals Information Institute: http://www.mii.org/

The Abandoned Mine Reclamation Program safeguards abandoned mine safety hazards while constantly and consistently exceeding the expectations of the people with whom we work.

OPTIONAL EXTENDED LEARNING

Use this space below to complete the activities throughout the workbook. Use any size paper you like for your drawings.

My Heritage: PAGE 6

How I would survive if I got lost in a mine: PAGE 8

My Abandoned Mine Safety Messages: PAGE 14

My story of life in a coal camp or mining town: PAGE 21
Use as much extra paper as you need to tell your story!

What is made from: PAGE 10

GYPSUM

OIL SHALE

POTASH

ARSENIC

FLUORSPAR

A miner I admire: PAGE 12

A mining job I learned about: PAGE 15

Fun and safe outdoor activities: PAGE 24

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