Hey Kids! Let's dig into Utah's heritage.
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*This workbook 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.
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!
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.

What minerals are already familiar to you?

List minerals that begin with the letter "G"

What mineral do you play with at the beach?
Every day!

- Bathtub: clay, iron
- Bicycle: chromium, nickel, iron
- Gasoline: coal, steam, oil (petroleum), gas, uranium
- Paints: clay, gilsonite
- Bricks: limestone, clay, shale
- Computer: gallium, germanium, gold, silica, beryllium, copper, oil

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?
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.

**CONSTRUCTION:**
- concrete
- tools
- bricks
- gloves
- lunch buckets
- hard hats

**FARMING:**
- fertilizer
- irrigation systems
- grain
- tractors

**FARMERS USE:**
- tractor
- irrigation systems
- grain
- fertilizer

**TRAVEL:**
- to travel around the world
- freeze-dried food
- rocket ships
- trucks
- cars

**TO TRAVEL AROUND THE WORLD AND INTO SPACE, WE USE:**
- seatbelts
- trains
- rocket ships
- trucks
- cars

**MUSIC:**
- drumsticks
- French horns
- cymbals
- trumpets

**TO PLAY MUSIC, WE USE:**
- drumsticks
- French horns
- cymbals
- trumpets
**Game!**

**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
   - [ ] Mercure
   - [ ] 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.


What nationalities brought these foods to our country?

__________________________

Can you name some other foods the immigrants brought?

__________________________

**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.

**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?

**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. I L D E L K
2. A G R E N D
3. T B E R A H E
4. I O O S U N P O S
5. A N B D E O A N D
6. U R H T
7. L S O T

SECRET MESSAGE

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.
UNIT 2

The answers to this crossword 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.
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.

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

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.

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
1. Chief Tintic
2. Patrick E. Connor
3. McIntyre Brothers
4. Samuel Newhouse

Contribution
a. Father of Mining in Utah
b. First copper smelter
c. Knew the value of silver
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’.

Optional Extended Learning
Tell which famous miner you most admire and why. Or draw a picture of this person!
Extended Learning: Can you think of other safety messages?

Game!

Try your skills at this grand challenge! Can you find your way through the maze?

Wines and dangers: Old buildings near abandoned sites can be treasures. Good luck!
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.
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.
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

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!
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.
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.

MINE TOWNS and COAL CAMPS
↑ HARD ROCK MINE TOWNS
↓ COAL CAMPS

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

STOP

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!
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.
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
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 circuits 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

Golden Spike completed RR Bingham Cyn Mine WWI Albert Einstein Utah #3 mineral producing state

1st miners use pick axes Madame Curie
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.

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Shaft" /></td>
<td>Shaft (Vertical)</td>
</tr>
<tr>
<td><img src="image" alt="Portal or Adit" /></td>
<td>Portal or Adit (Horizontal)</td>
</tr>
<tr>
<td><img src="image" alt="Tunnel" /></td>
<td>Tunnel (two connecting entrances)</td>
</tr>
<tr>
<td><img src="image" alt="Prospect or General Mining" /></td>
<td>Prospect or General Mining</td>
</tr>
<tr>
<td><img src="image" alt="Open Pit or General Mining" /></td>
<td>Open Pit or General Mining</td>
</tr>
<tr>
<td><img src="image" alt="Mine Dump, Tailings or Surface Mining" /></td>
<td>Mine Dump, Tailings or Surface Mining</td>
</tr>
<tr>
<td><img src="image" alt="Depression, Open Pit" /></td>
<td>Depression, Open Pit</td>
</tr>
</tbody>
</table>

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

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 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/
To learn more about mining in Utah, contact this State Agency:

ABANDONED MINE RECLAMATION PROGRAM
Utah Division of Oil, Gas, and Mining
Box 145801
Salt Lake City, UT 84114-5801
Email amrinfo@utah.gov
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http://twitter.com/utahogm

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

AND
REMEMBER
STAY OUT OF OLD MINES!