

Teacher's Guide

AG IN THE CLASSROOM—HELPING THE NEXT GENERATION UNDERSTAND THEIR CONNECTION TO AGRICULTURE

Resources

State of Colorado, Department of Natural Resources, Division of Reclamation, Mining, and Safety

Find mining information about your county at <http://mining.state.co.us/>. Children can play games and find links to related websites at <http://mining.state.co.us/kids/dmgkids.htm>.

For more on the Henderson Mine Project
National Science Foundation

<http://www.nsf.gov/> and

Husep Outreach

<http://crop.unl.edu/claes/HUSEP/HUSEPoutreach.html>

Mineral Information Institute

501 Violet Street, Golden, CO 80401
303/277-9190

www.mii.org has more than 200 pages of classroom lessons and activities which are available for free download. In addition they have a wide variety of mining and rock/mineral posters, videos and other teaching tools, including gold panning kits—all either free or at below normal prices. MII's website also features "before and after" mined-land reclamation stories and photos from more than 250 different locations.

Clear Creek Watershed Foundation

303.567.2699 — P.O. Box 1963,
Idaho Springs, Co 80452
www.clearcreekwater.org (website being developed)

ccwfoundation@clearcreekwireless.com

Learn more about this 575-square mile watershed that was home to the Colorado Gold Rush and that is now pioneering new approaches to sustainable watershed management. Available soon, full copies of "A Summer of Gold" Student Workbook.

Comments, questions, suggestions and feedback about the *Colorado Reader* are welcome.

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More about "The Summer of Gold" by Christine M. Crouse

This is the story of Jack, a young boy who learns about the importance of Colorado's mining history on his family heritage and his modern lifestyle. Through his adventures with his Grandma Rose in Idaho Springs, he learns about mining history, geology, mineral uses, and related environmental issues. Some of the basic concepts covered:

- Mining was important to Colorado becoming a state. Following the California Gold Rush, many miners came to the Colorado Territory to try their luck. Business people soon followed, the Colorado Gold Rush was on, and a state was born!
- Mining in the 1800s was done with hand tools and was very dangerous. Mining technology has evolved and improved over the years, and now most mining is done on a very large scale with complex machinery and is much safer and faster.
- Gold mining led to the discovery of many other minerals in our state. Minerals are valuable natural resources. They are extracted through a process called mining, and are used to make things we use everyday—oftentimes without even realizing it! (Where do bricks come from? Steel beams? Cell phones? Computers? Tennis shoes? Roads? Cars? Fuel? Electricity? We all benefit from mining and life would be very different without it.)
- In the early days of mining, the effects of mining practices to the environment were not of much concern. Today, however, protecting our environment is very important and is a major industry in itself. Many environmental laws have been passed to protect the air, water and land from mining. The concept of environmental remediation is introduced.
- Colorado's economy still depends on mining—for direct jobs, energy production, etc.

This Teacher's Guide offers many add-on activities, worksheets, and discussion topics for you to use with your students. We hope you and your students enjoy exploring Colorado's rich mining history and learning about how mining affects our modern lifestyles and our choices as consumers and citizens.

Colorado's Silver Lining

In June of 1859, the Griffith brothers, George and David, discovered gold west of Idaho Springs in what is now Georgetown. Not much gold was found here, but in 1864, large deposits of silver were discovered and Georgetown soon became known as the "Silver Queen of the Rockies." Miners kept moving westward, and about ten years later, large veins of silver were found in Leadville. During the 1870s and 1880s, undreamed of amounts of wealth were mined in the mountain towns of Leadville,

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Page 2 Answers

Why was the prospector happy when he sneezed?

To discover the answer, solve these math problems. Then match the solutions to the numbers on the lines below.

T H E R E W A S G O L D D U S T I N T H E A I R !
 75 11 219 120 219 813 30 205 9 990 240 17 17 175 205 75 192 15 75 11 219 30 192 120

(continued from page 1)

Aspen, Creede, Telluride, Ouray, Silverton, Rico, Tin Cup, and others. In 1894, the largest silver nugget ever discovered in the U.S. was found in Aspen—weighing in at 1,840 pounds!

The Silver Ladies

A man named James J. Brown made a fortune from the Leadville silver mines. If he doesn't sound familiar, maybe you've heard of his wife, Mary. She became famous after she survived the sinking of the Titanic in 1912. After that, her nickname became "the Unsinkable Molly Brown." Her house in downtown Denver is now a museum.

Baby Doe Tabor lived the good life as the second wife of silver tycoon H.A.W. Tabor of Leadville. He was a store owner in Leadville and "grubstaked" two miners. That means he loaned them money to start a mine in return for part-ownership of the mine. It was a good investment—that mine made them all rich! The Tabors led an extravagant lifestyle until the "Silver Crash" of 1893. Baby Doe died alone and penniless in a dilapidated cabin near the famous Matchless Mine.

More Interesting Facts About Minerals in Colorado...

One of the world's most productive underground coal mines is the Twenty Mile Mine in northwest Colorado, located near Steamboat Springs. Here the coal is mined from an underground, 10-footwide area. The coal from this mine is very clean. Other mines have to wash their coal several times before it

can be burned to make electricity or made into other products. Two or three trains come to the mine daily to haul the coal away to electrical plants or other factories. Coal is used to make about 80% of our state's electricity. Every time you flip on a switch, you are using minerals. Do you know about any other ways to generate electricity? Have you heard of renewable energy? What does energy conservation mean? How can you conserve energy?

One of Colorado's largest natural resource supplies is sand and gravel which are mined from rock quarries. Some minerals found in sand and gravel are quartz, feldspar and mica. Sand and gravel are ingredients for concrete, which is used a lot for building and road construction. 340 million pounds of concrete were used to construct Invesco Field in Denver! Can you imagine how much sand and gravel is needed to build parking lots? Sidewalks? Roads? Runways?

Reinforced steel, which is made from iron mixed with other minerals (alloyed), is used to make skyscrapers. Denver has more than 50 skyscrapers! The CF&I steel mill is located in Pueblo. What other things do you use that are made from steel?

BLACK GOLD!

Oil was first drilled in Titusville, Pennsylvania in 1859. Colonel Edwin Drake was drilling for water to use at his home. Instead of water, he found oil!

In 1860, the second US oil well was drilled—in Colorado! This well led to the discovery of the Florence Oil Field near Pueblo. The small village of

Page 7 Answers

What's Your Your Daily Dose of Minerals?

Minerals are really important to our everyday lives. Without minerals we would not have things like houses, cars, skateboards, bikes, computers, t.v.s, CD players, drinking glasses, windows, light bulbs, even toothpaste, and shampoo! Take a look around - almost everything we use is made from minerals that were mined from Earth. Even our bodies contain minerals that keep us alive! Go online and research what the following common items are made from and draw a line from the mineral ingredients to these everyday items.



- 1) concrete =
 - 2) toothpaste =
 - 3) stainless steel =
 - 4) shampoo =
 - 5) window glass =
 - 6) nails and screws =
- a) coal tar + lithium clay + selenium
 - b) silica sand + limestone + sodium carbonate
 - c) limestone + clay + iron oxide + gypsum
 - d) silica + fluorite + titanium + mica
 - e) iron + hematite + magnetite + zinc
 - f) nickel + chromium

Florence “boomed!” This means there was a lot more activity and lots more people. At the peak of the “boom,” there were 25 oil companies and refineries in or near Florence. Many years later, the oil in the ground began to run out. Most businesses closed and people had to move. By 1920, the town went “bust” and there were only a few oil wells left. This is called a “boom and bust” cycle.

Since that time, more than 55,000 oil wells have been drilled in Colorado. In the 1920s, oil exploration was one of the main industries in the state. To find out how many oil wells are active in Colorado today, go to www.oil-gas.state.co.us.

Getting Your Daily Dose

In the story, Jack’s Grandma Rose says that “Most people don’t realize that life would be very different if it weren’t for mining.” Ask the students what they think she meant by this statement. This is an excellent segue into the importance of mining and a discussion on “Where Stuff Comes From” and/or “If It Can’t Be Grown, It Has To Be Mined.” Make a class list of things you use everyday—from silverware to automobiles, from toothpaste to televisions.

Almost every product we use is made from one or more minerals—any metal, porcelain, or glass product is derived from minerals. Almost any part of a car, truck, van, airplane, bus, bike, skateboard, scooter, etc. comes from minerals—including the motor oil and gasoline. Plastic items (including toys!), synthetic clothes and shoes, even many make-up products, are made from petroleum (a fossil fuel which is drilled—a form of mining).

Electricity to heat our buildings and power our

appliances is generated primarily by coal and natural gas (more fossil fuels). Challenge students to think of something that doesn’t somehow come from minerals—even natural, cotton material is made in factories through the use of metal tools.

Minerals are natural resources that are non-renewable. What is the difference between renewable resources and non-renewable resources? Natural resources are materials from nature that are used to produce things we use. Non-renewable resources are not regrown or regenerated naturally within a reasonable period of time (minerals & fossil fuels). If managed carefully, renewable resources (such as water, wood) can be used continually without being used up.

Rock On!

Rocks are more complex than they seem. They are the hard, solid parts of Earth’s crust. Just like each person is unique, rocks have special features that make them unique. There are three types of rocks:

- igneous— from volcanoes,
- sedimentary — formed in layers, and
- metamorphic— formed by heat and pressure to igneous and sedimentary rocks that already existed.

Rocks are made up of one or more minerals. A mineral is a non-living (inorganic) solid found in nature that is not a plant or an animal. There are about 3,000 different kinds of minerals—including gold and silver.

Make a Timeline

Get a long strip of butcher paper and title it: Colorado History Timeline. Have students highlight

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all the important/interesting events found in the story and sideboxes (plus any others they know about) and appropriately place them on the timeline. If you'd like, have them illustrate the events, also.

Past Current Events! (adapted from *Colorado Current Events Projects* by Carole Marsh)

Events that happened in Colorado long ago were current events when they actually occurred. Choose an important or interesting event from the Colorado Gold Rush and write a newspaper story about it. Write your story as if you were back in Colorado history at the time this event was happening. Use authentic language. Be sure not to make any references to outcomes or future events that wouldn't have been known back then.

Write your own historical "breaking news story" on a section cut from a brown paper bag. Illustrate it with an old-time drawing. Crumple up the paper and then smooth it out again to "age" your project! Or, have a time-traveling reporter interview some '59-ers! (Add-On: Research the history of journalism and find out when the printing press was invented, etc. How did that invention change society?)

Gold Expressions (adapted from a *Mineral Information Institute* activity)

Have students brainstorm, research, and present what they discover about gold-related expressions and metaphors such as: worth your weight in gold, good as gold, a golden opportunity, all that glitters is not gold, gold standard, and heart of gold.

Mining Homonyms

As you work on this unit, keep running a list of mining words that are homonyms, such as: miner / minor, load / lode, ore / or, and karat / carrot. What others can you come up with?

Webster's Old-Time Dictionary

Have each student choose five mining terms from the story and create an illustrated dictionary entry for each term on a 3"x5" index card. Have them alphabetize the cards and make their own class dictionary. Multiple entries are allowed—and fun to compare!

There Were Some REAL Characters!

Choose an historic mining character. Do some more research and write a report on his or her life story and include a few illustrations in your biography. Or--let the students pretend to be their character and give an oral report/skit—costumes optional!

PS—Wish You Were Here!

Pretend you're a '59er. Write a letter to your best friend back east trying to convince him or her to come out and join you! How much did a stamp cost back then? (Look for prices of items in *A Walk Through Colorado History*.) Did they even use stamps back then? What about ink and paper? How long did it take to send a letter? You can take it a step further by having students research forms of communication—the telegraph, the Pony Express, etc.

Colorado Content Standards

This issue of the Colorado Readers helps you achieve the following Colorado Content Standards.

GEOGRAPHY

Standard II: Students know the physical and human characteristics of places, and use this knowledge to define and study regions and their patterns of change.

Standard IV: Students understand how economic, political, cultural, and social processes interact to shape patterns of human populations, interdependence, cooperation, and conflict.

HISTORY

Standard I: Students understand the chronological organization of history and know how to organize events and people into major eras to identify and explain historical relationships.

Standard II: Students know how to use the processes and resources of historical inquiry.

Standard III: Students understand that societies are diverse and change over time.

Standard IV: Students understand how science, technology, and economic activity have developed, changed, and affected societies throughout history.

MATHEMATICS

Standard I: Students will utilize language, symbolism, and technology to develop number sense and to communicate those mathematical ideas.

READING/WRITING

Standard I: Students read, listen to, and understand a variety of materials.

Standard II: Students write and speak for a variety of purposes and audiences.

Standard III: Students write and speak using conventional grammar, usage, sentence structure, punctuation, capitalization, and spelling.

Standard IV: Students apply thinking skills to their reading, writing, speaking, listening, and viewing.

Standard VI: Students read and recognize literature as a record of human experience.

SCIENCE

Standard IV: Earth and space science—students know and understand the processes and interactions of Earth's systems and the structure and dynamics of Earth. (Focus: Geology).

Standard V: Students know and understand interrelationships among science, technology, and human activity and how they affect the world.