

Black Butte Mine Video – Teacher Guide

Description

The Black Butte Mine Superfund Site is located near Cottage Grove, Oregon in Lane County. Mercury and other contamination from tailing piles at the abandoned mine site affect the Coast Fork Willamette River and creeks that flow into Cottage Grove Reservoir.

This video was created for students to learn about the history of their community. Many people have no knowledge of the Black Butte Mine or the role it played in local and national history. The history of the Black Butte Mine is fascinating and important for the current environmental health of the surrounding community. The video is about 11 minutes long and includes interviews with local people sharing their first-hand experience at a Cottage Grove Historical Society event.

Student Outcomes

After watching the video and completing the worksheet, students will be able to:

- Create a timeline of significant years for the mine activities
- Identify three key features of the Black Butte Mine
- Pinpoint three ways mined mercury was beneficial to the nation
- Share what is happening today in the watershed of the Black Butte Mine

Student Products

- Black Butte Mine Worksheet

Suggested Lesson Plan

Before watching the video

Some of the vocabulary used in this video may not be familiar to the students. A vocabulary list is included. It may be helpful to go over these vocabulary terms with the students before watching the video.

To help the students begin thinking about mercury and mining, it may be helpful to first show the video: ***Mercury in the SF Bay***, which includes a worksheet and teacher key.

(<http://superfund.oregonstate.edu/mercury>).

For younger students, you may want to only show parts of the video and adapt the worksheet and extension activities.

After watching the video

Student can work in pairs or small groups to do the worksheet. It may be helpful to do some sections as a class. Students may need to watch the video more than once to find all the answers.

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Suggested Extension Activities

- **Have students find the Black Butte Mine site on a map.**
 - It may be interesting to use Google Earth or Google Maps and view the area in 3D.
 - How far is the Black Butte Mine from their school? From their home?
 - Which river and streams are in the watershed of the mine site? Which reservoirs?

- **Have students create their own map of the area using color pencils.**
 - What would they personally want to include on their map? These maps can be displayed.

- **Have students create a timeline from the worksheet of key events.**
 - The activity of the Black Butte Mine was driven by the price for mercury. This could be used to talk about U.S. economic history such as the Great Depression.
 - Students can be creative and add other events to the timeline or do a parallel timeline comparing other historical events that were happening in the world during that time, such as US Presidents in office, wars, discoveries, civil rights, disasters, celebrations, etc.

- **Bring math into the activity.**
 - How many years was the mine open?
 - How many years after the mine closed did it take to be on the National Priorities List (NPL)?
 - Add your birthday, a parent’s birthday, a grandparent’s birthday, and a great grandparent’s birthday to the timeline. How many years are they apart? What happened at the mine when they were born?

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Terminology

Mine: A pit, tunnels, and shafts made in the earth for the purpose of taking out ores, coal, precious stones, etc.

Mining: The act of extracting ore from the rocks

Furnace: A structure at the mine that heated the cinnabar and created liquid quicksilver

Cinnabar: A mineral, mercuric sulfide (HgS), occurring in red crystals or masses: the principal ore of mercury

Quicksilver: The metallic element mercury, known as “quicksilver” because of its silvery color and heavy liquid texture. Processing cinnabar creates quicksilver.

Mercury: a naturally occurring element that is found in cinnabar. It is used in thermometers, barometers, mercury-vapor lamps, and dental amalgams (teeth fillings). Symbol: Hg; atomic no: 80; atomic wt: 200.59; valency: 1 or 2; relative density: 13.546; melting pt: -38.842°C ; boiling pt: 357°C

Ore: A metal-bearing mineral or rock, or a native metal that can be mined at a profit

Ore hopper: A temporary storage bin, filled from the top and emptied from the bottom, often funnel-shaped.

Mine Tailings: Tailings are waste material from ore processing that contains residual Hg (in the case of the Black Butte Mine site). The Hg content is limited based on the efficiency of the ore processing. This lingering mercury that is left behind from the Mill site can find its way into the air and water.

National Priorities List: A list of places in the United States that are a priority for cleaning up because they are known to release, or threaten to releases, of hazardous substances into the environment. The National Priority List is intended to guide the EPA in determining which sites warrant further investigation and clean up.

Watershed: The area of land where all of the rain that falls on it and water that is on it (rivers, streams, creeks, ponds, lake, the ocean, etc.) flow to the same place. If one part of the watershed gets polluted, the other parts can get polluted.

Fate and Transport of contaminants: Contaminant distribution, transport, and transformation on hazardous waste sites.

Reservoir: A large natural or artificial lake used as a source of water supply.

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Student Worksheet Key

1) Draw a line matching the year with the event related to the Black Butte Mine.

1897	Mercury was discovered at mine site
1899	First shipment of mercury from Black Butte
1905	Furnace was built at the mine site
1909	Price of mercury dropped and the mine closed temporary.
1914-1918	Demand for mercury skyrocketed, because it was used to make rockets
1929	Stock market crashed; a group of local residents bought the mine.
1939-1945	There was a second demand for mercury because of a World War. Now mercury was important for new technology products like electric switches.
1969	Mine closed
2010	The Mine became part of the National Priorities List

2) Pinpoint three ways mined mercury was beneficial to the nation

- Used in artillery for the Wars
- Used in technology products such as electric switches
- Gave people jobs and money – helped the economy

3) Name three key features of the Black Butte Mine

- Highest producing mercury mine on the west coast (or world)
- Largest deposit of cinnabar in the world
- The ore hopper and furnaces still remain on the property
- Tailings are left behind on the property
- After closing, known as 4th largest producer of mercury in Oregon

4) Share what is happening today in the watershed of the Black Butte Mine

- It is listed on the Superfund National Priority List (so it receives federal funds for long-term clean-up)
- Mercury and other contamination from tailing piles at the abandoned mine site affect creeks that flow into Cottage Grove Reservoir and the Coast Fork Willamette River. The EPA is monitoring the fate and transport of contaminants and assessing how to clean it up.

“The Community Involvement Plan” outlines activities that EPA plans to ensure that the public remains informed about site activities throughout the cleanup process. More information on-line:

<http://1.usa.gov/1opjnLr>