



BLAST IT! Learning About AZ Copper Mining

Adapted from: Arizona Mining Association - various resources (with permission)

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Grade Level	3
Duration	2 class periods

National Standards

GEOGRAPHY

Element 1: The World in Spatial Terms

1. How to use maps and other geographic representations, geospatial technologies, and spatial thinking to understand and communicate information

Element 3: Physical Systems

7. The physical processes that shape the patterns of Earth's surface

Element 5: Environment and Society

14. How human actions modify the physical environment

16. The changes that occur in the meaning, use, distribution, and importance of resources

Element 6: The Uses of Geography

17. How to apply geography to interpret the past

18. How to apply geography to interpret the present and plan for the future

AZ Standards

ELA

Reading Key Ideas and Details

3.RI.1 Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers.

Writing Production and Distribution of Writing

3.W.4 With guidance and support from adults, produce writing in which the development and organization are appropriate to task and purpose.

Arizona Social Science Standards

GEOGRAPHY

The use of geographic representations and tools helps individuals understand their world.

3.G1.1 Use and construct maps and graphs to represent changes in Arizona over time.

Human-environment interactions are essential aspects of human life in all societies.

3.G2.1 Explain how people modify and adapt to the Arizona environment.

Global interconnections and spatial patterns are a necessary part of geographical reasoning.

3.G4.1 Describe how Arizona has changed over time.

HISTORY

The development of civilizations, societies, cultures, and innovations have influenced history and continue to impact the modern world.

3.H1.1 Utilize a variety of sources to construct a historical narrative exploring Arizona's cultures, civilizations, and innovations.

Economic, political, and religious ideas and institutions have influenced history and continue to shape the modern world.

3.H3.2 Use primary and secondary sources to analyze the changes that have taken place in Arizona which could include the use of current events.

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SIOP Elements		
Preparation Adapting content Linking to background Linking to past learning Strategies used	Scaffolding Modeling Guided practice Independent practice Comprehensible input	Grouping Option Whole class Small groups Partners Independent
Integrating Processes Reading Writing Speaking Listening	Application Hands on Meaningful Linked to objectives Promotes engagement	Assessment Individual Group Written Oral

Arizona ELP Standards

Grade 3

Basic

Listening and Reading

Standard 1 By the end of each language proficiency level, an English learner can construct meaning from oral presentations and literary and informational text through grade appropriate listening, reading, and viewing.

B-1: ask and answer questions by using evidence from a text.

B-2: determine the central topic or message.

B-3: identify key details that support the main idea or message.

Standard 2 By the end of each language proficiency level, an English learner can determine the meaning of words and phrases in oral presentations and literary and informational text.

B-1: determine the meaning of frequently occurring academic and content-specific words and phrases.

Speaking and Writing

Standard 3 By the end of each language proficiency level, an English learner can speak and write about grade appropriate complex literary and informational texts and topics.

B-3 compose informational text that includes details to develop a topic while using appropriate conventions.

Overview

Of all the 50 states, Arizona is the leading state in copper production and is known as the "Copper State." The copper industry is important to Arizona's economy, employing thousands of people and bringing in billions of dollars. What has created such vast amounts of this mineral deposit in Arizona and how is it discovered are the topics of this lesson.

Purpose

This lesson introduces students to the natural resource of copper through a mapping activity, a vocabulary game, a sentence game, and a reading assignment.

Key Vocabulary/Phrases

volcano - opening in the earth's crust in which the magma can pass to the surface

copper - a reddish-brown metal that is an excellent conductor of electricity

terraces - the various levels in an open pit mine

shaft - a vertical opening of an underground mine

open pit mine - large hole dug in the ground for the removing copper ore

underground mine - digging beneath the earth's surface to remove copper ore

Materials

- Popular objects for the class to view: cell phone, batteries, battery operated toys and machines, computer, breakfast cereals (check ingredients),

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Hershey's Milk Chocolate Mix (check ingredients), copper pipe, electric wiring, jewelry, pans, brass and/or tin items

- Copper: Investing in Our Planet's Future
<https://resolutioncopper.com/resolution-copper-mine/why-copper-matters/>
- 2015 Arizona Major Mines
http://repository.azgs.gov/uri_gin/azgs/dlio/1670
- Map Activity Worksheet and Answer Key
- Vocabulary Cards
- Mural Narrative--Learning About Copper reading
- Arizona Copper Mural
- Crayons or colored pencils
- Chat Talk and Scoring Guide
- Word Search and Answer Key

Objectives

The student will be able to:

- locate major copper mines on a map.
- use vocabulary words that pertain to copper.
- summarize important facts about copper mining in Arizona.
- identify objects that contain copper

Procedures

SESSION ONE and TWO

1. Begin the lesson by exhibiting a variety of items in front of the classroom. (See Materials) Ask students if they know what *these items have in common*. After a brief discussion, explain that the items all contain copper. Without copper, we would not be able to use these items. How would they feel if they did not have these items? **(Grouping: Whole Class)**

2. Ask the students if they know anything about copper. Record their responses on the board. Explain that they will learn more about exploration and discovery of copper in this lesson.

(Preparation: Linking to background, Grouping: Whole Class)

3. Show the Video, Copper: Investing in Our Planet's Future (2.04 min)

<https://resolutioncopper.com/resolution-copper-mine/why-copper-matters/> Have students add to their responses on the board.

4. Distribute and project the 2015 Arizona Major Mines map.

http://repository.azgs.gov/uri_gin/azgs/dlio/1670

5. Have students circle the copper mines on the map. Distribute the Map Activity Worksheet and explain the directions. Allow students to partner if they want and complete the worksheet.

(Application: Hands-on, Linked to Objectives, Promotes Engagement; Grouping: Partners, Individual)

6. Explain that these are words we will be using to learn about copper mining. Distribute the Vocabulary Cards that have the definitions separated from the pictures. Have students match the 7 definitions to the correct pictures. Project the Vocabulary Cards with their definitions attached so students can check their answers. **(Grouping: Partners, Independent; Scaffolding: Comprehensible Input; Application: Hands-on, Promotes Engagement, Links to objectives)**

7. Students can work individually or together in teams and develop creative sentences using as many vocabulary words as possible. For example: **Copper** is found in the **crust** of the earth.

(Preparation: Linking to Past Learning)

(Grouping Option: Independent or Partners;

Application: Promotes engagement, Hands on, linked to objectives)

8. Project the Arizona Copper Mural. Distribute the Mural Narrative to the students. Read the Mural Narrative--Learning about Copper" as you point out the process of getting copper from the earth to its use in our final products. Begin in the left-hand corner where the CD, battery, etc. are and continue clockwise around the mural. **(Grouping: Whole Class; Scaffolding: Guided Practice; Application: Promotes engagement)**

9. Distribute a copy of the Arizona Copper Mural to the students and have them read with a partner the narrative. Instruct them to stop at each image as it is mentioned in the reading and color it. **(Integrated Processes: Reading, Writing, Listening; Scaffolding: Comprehensible input)**

Note: A variation on this step would be to give students blank paper and have them draw their own murals. One image for each paragraph.

10. Collect the narratives. Explain the Chat Talk and how the written "chat" will be graded (Scoring Guide). Allow students to use their AZ Major Mines map if desired.

11. As students finish, distribute the Word Search.

Assessment

ELA and Social Science

Chats can be graded using the Scoring Guide. Mastery will be considered a score of 24 points or higher.

A test over the vocabulary used in the lesson could be given. Teacher could prepare a test or have students match the word to its definition using the

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Vocabulary Cards. Mastery would be a score of 100%.

Murals could be graded for correctness and completeness. Assign points for each of the 7 paragraphs with an appropriate image.

Extra credit points could be given to students who complete the Word Search Puzzle. The Word Search contains 25 vocabulary words.

Geography

The Map Activity Worksheet can be graded for correctness. Mastery will be considered of 8 or more questions correctly answered

Extensions

Students can access the AZ Mining Association website <https://azmining.com/> and check out careers in the mining industry.

Sources

Arizona Mining Association (AMA)
<https://azmining.com/>

A History of Mining in AZ by Larry McBiles
<https://resolutioncopper.com/wp-content/uploads/2018/07/AZ-Mining-History.pdf>