BLAST IT: Learning About Copper!
Students learn about the copper industry and practice vocabulary skills too.

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

<table>
<thead>
<tr>
<th>Author</th>
<th>Patty Sepp</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade Level</td>
<td>6-8</td>
</tr>
<tr>
<td>Duration</td>
<td>2 class periods</td>
</tr>
</tbody>
</table>

National Geography Standards

ELEMENT THREE: PHYSICAL SYSTEMS
7. The physical processes that shape the patterns of earth's surface.

ELEMENT FIVE: ENVIRONMENT AND SOCIETY
16. The changes that occur in the meaning, use, distribution, and importance of resources.

Arizona Geography Strand

Grade 6
Strand 4 Geography
Concept 3 Physical Systems
PO 1 Identify the physical processes that influence the formation and location of resources. (e.g., oil, coal, diamonds, copper)

Concept 5 Environment and Society
PO 1 Describe ways that human dependence on natural resources influences economic development, settlement, trade and migration

Grade 7
Strand 4 Geography
Concept 5 Environment and Society
PO 1 Identify the physical processes (e.g., conservation of natural resources, mining, water distribution in Arizona) that influence the formation and location of resources

Grade 8
Strand 4 Geography
Concept 5 Environment and Society
PO 2 Describe why humans modify ecosystems

Other Arizona Standards

ELA Common Core Standards
Reading
Craft and Structure
6-8.RH.4 Determine the meaning of words and phrases as they are used in a text, including vocabulary specific to domains related to history/social studies.

Range of Reading and Level of Text Complexity
6-8.RH.10 By the end of grade 8, read and comprehend history/social studies texts in the grades 6–8 text complexity band independently and proficiently.

Writing
Text Types and Purposes
6-8.WHST.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.

a. Introduce a topic clearly, previewing what is to follow; organize ideas, concepts, and information into broader categories as appropriate to achieving purpose; include formatting (e.g., headings), graphics (e.g., charts, tables), and multimedia when useful to aiding comprehension.

b. Develop the topic with relevant, well-chosen facts, definitions, concrete details, quotations, or other information and examples.

c. Use appropriate and varied transitions to create cohesion and clarify the relationships among ideas and concepts.

d. Use precise language and domain-specific vocabulary to inform about or explain the topic.

e. Establish and maintain a formal style and objective tone.

f. Provide a concluding statement or section that...
Blast It: Learning About Copper!

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. Students will write a summary about the formation and exploration of copper in Arizona using copper vocabulary words.

Materials

- Copper Mines in Arizona Map
- Copper Mines in Arizona—Map Activity Worksheet and answer key
- Blast It--Learning About Copper Vocabulary Words
- Sentence Game
- Blast It--Learning About Copper reading
- Word Search (optional) and answer key
- Strip Roll of calculator paper (cut into 1-2 yard strips)
- Scissors and glue sticks
- Various popular objects for the class to view that contain copper. Use items that are convenient to locate and place in a classroom, for example: phone, game boy, battery, battery operated toys, watch, clock, calculator, tape recorder, CD Player, Computer, breakfast cereals (check ingredients), Hershey’s Milk Chocolate Mix (check ingredients), copper pipe, electric wiring, jewelry, pans, brass and/or tin items.

Objectives

The student will be able to:

- locate major copper mines in Arizona.
- identify vocabulary words that pertain to copper.
- write a sentence using copper vocabulary words.
- summarize important facts about the formation and exploration of copper.
- identify objects that contain copper

Procedures

SESSION ONE
1. Exhibit a variety of items in front of the classroom. (See Materials section for some examples). 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?

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

3. Most copper produced in the U.S.A. is from Arizona. Where are the copper mines located in Arizona? Using the Copper Mines in Arizona map and the Map Activity Worksheet, students will locate major Arizona copper mines practicing cardinal directions.
Blast It: Learning About Copper!

4. Distribute Vocabulary Words. The vocabulary words and the words used in a sentence are on the left side. The vocabulary definitions are on the right side. Cut the handout in half vertically between the vocabulary words and their definitions so the definitions are separated. Cut up the 10 vocabulary definitions into individual parts and turn upside down. (Do NOT cut up the left side with the vocabulary words and sentences!) Read with the students the left side containing each vocabulary word and its sentence.

Vocabulary Game: Challenge the students to match the definitions to the correct vocabulary words. (Teacher may have students work as a team or individually.) Time the students (usually 2-4 minutes). When time is up, review the words and their definitions and see how many students got them correct.

5. Sentence Game
Give students a long strip of blank adding machine paper (about 1-2 yards).
Pass out the Sentence Game - Part 1. These are the same vocabulary words previously learned. Cut these ten words into individual squares. Students can work individually or together in teams and develop a creative sentence using as many vocabulary words as possible. After they develop a sentence, write the sentence on the calculator paper inserting and gluing the vocabulary words in their proper spaces.

SESSION TWO
1. Read Blast It--Learning about Copper. Read it aloud or give as an individual assignment.
(Vocabulary Words are reviewed in BOLD print in this handout.)

2. After reading Learning about Copper students should write a summary using the vocabulary words. (See writing prompt below.) It should include how copper was formed in Arizona, identify the process of exploration and discovery of copper, explain the location of some Arizona copper mines, and identify at least two products that use copper.

Writing Prompt: You are a copper rock collector and have been asked to write an article for your Arizona Rock Club. In your article, using the copper vocabulary words describe how copper was formed in Arizona, identify the process of exploration and discovery of copper, explain the location of some Arizona copper mines, and identify at least two products that use copper.

Assessment
Student summaries will be assessed on the 6-Trait Writing Rubric in the areas of organization, sentence fluency, and conventions. Four out of 6 will be considered mastery.

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

Extensions
Student can write or e-mail the Arizona Mining Association for further research materials.

Research more about copper at the Arizona Department of Mines and Mineral Resources: http://www.admmr.state.az.us/rockhound.htm

Students can write a state geologist or mining university to inquire about a career in mining or ask further questions about copper.

Sources
Arizona Mining Association (AMA) 2792 N. Third Street Phoenix, AZ 85007 602-266-4416 website: http://www.azcu.org 1. Poster "COPPER" from the AMA (also available online) 2. Video "Mining the Net" (w/ accompanying instructional guide from the AMA). 3. Many online activities (downloadable)

Teacher Prepared Resources (no cost) for extended lessons. Units developed through summer workshops. PreK, 4-6, 7+ grades (NEED TO ORDER IN ADVANCE)
www.azcu.org/educators/index.html (for details)