

Mining and Mineral Unit

Unit: In this unit, you will be learning the importance of mining and minerals are an important commodity in the state of Arizona. We will first learn about the differences between a rock and a mineral. Yes, they have many similarities, but this does not make them the same thing. We will dabble into the different properties that minerals display and use these properties to identify different minerals. After identifying the minerals, we will continue into the mining segment of the unit. We will perform a couple of modeling activities of mining. We will analyze and apply our results from these activities to real life mining situations.

Background: Arizona has one the richest deposits of uranium bearing minerals inside and around Grand Canyon National Park. Uranium ores are processed to be used for various ways including weaponry and nuclear power. Uranium is a significant resource that is in high demand from many nations for the use of nuclear power. Nuclear power is considered to be a green energy, which helps light the burden of petroleum and fossil fuel demand for power.

Mining Companies want to exploit the land around the Grand Canyon to get these minerals. Many Arizona government officials and other state government officials want to allow mining. These officials have partnered with many companies to try and open new mines in and around the Grand Canyon National Park because they see the resources as valuable materials for the United States' economy.

Environmental agencies, Native American tribes, different politicians, and government departments do not want the mining. They see uranium ore mining as a threat to Arizona's numerous ecosystems, scarce drinking water, and archeological sites. These agencies have all come together in order to prevent the mining to start in this region. In 2009, the courts ruled in favor of these agencies and prevented mining in the Grand Canyon; however, one mine, Arizona 1, was allowed to continue operate because it existed long before the current revelations and argument about this controversial topic. All new mining has been blocked in the area, but people still are fighting for the claim to do so

Question: Should uranium ore mining be allowed in the area of the Grand Canyon National Park?

Project: Write an argumentative 1-2 page letter answering the override mining and mineral unit question with your view of the controversial topic. You must do some research to support your vision about this issue.

Outcome: By the end of the unit, students will create an end of the unit artifact answering this question. The artifact for this unit will be an argumentative letter to an Arizonan politician stating view about the controversial topic. In this letter, you will respectfully state view on the topic, and state and cite your lines of evidence to support your view/claim. Again, this letter is to be respectful, informative, and academic writing assessment practicing research skills.

Unit Objectives: I will be able to...

- List the five characteristics that define a mineral
- Explain the similarities and differences between rocks and minerals
- Describe the mineral properties of hardness, color, streak, luster, cleavage, fracture, etc.
- Explain the difference between cleavage and luster
- Explain why color is not a useful property of a mineral
- Identify minerals using their various properties
- Describe the two types of mining used in Arizona and the United States
- Analyze the results of different mining modeling activities and relate them to the pros and cons of mining

Getting Started: Information and many sources will be posted on my class website at <http://dvhshamiltonearthscience.weebly.com/>. Visit the following website/prezi: <http://prezi.com/ebn9n9b5zksh/uranium-mining-around-the-grand-canyon-az/>. Go through the presentation to start shaping your view about the issue.

Submitting Project: All students must turn in their letter via the internet using the site, www.turnitin.com. Mr. Hamilton will discuss how to sign up for this site during class time. This website will be utilized to make sure no plagiarism occurs when writing this paper.

Who should I address my letter to?

Proponent of Uranium Mining in the Grand Canyon

- Senator John McCain
- Governor Jan Brewer
- Senator John Kyl
- Rep. Trent Franks
- Rep. Jeff Flake
- Rep. Paul Gosar
- Rep. Ben Quayle
- Institute for Energy Research
- Nuclear Energy Institution
- American Clean Energy Resources Trust

Opponent of Uranium Mining in the Grand Canyon

- United States Department of the Interior
- Bureau of Land Development
- National Forest Service
- National Parks Service
- Arizona Tourism Alliance
- Navajo Nation
- Hopi Tribe
- Havasupai Tribe
- Hualapai Tribe

Resources: You must use at least 5 different sources for this project. You must cite your sources and provide in-text citations in your letter. Some valuable resources are as follows:

- Uranium Mining Prezi mentioned above (has many usable resources in their citation page)
- ESBCO Host – find articles in your lexile score
- Local and National Newspaper articles
- Websites from Professional Government Organizations – USGS, EPA, US Dept. of Interior
- Websites from Colleges and Universities
- Documentaries

Unit Topic Schedule:

Topic:	Lesson Outline:
Unit Intro and Is it a mineral, rock, or neither	Introduction to the Unit, Is it mineral, rock, or neither? Activity, What are minerals notes
Mineral Properties: Color, Luster, Streak, and Hardness	Property Notes and Applying properties to mineral kits
Mineral Properties: Cleavage and Fracture	Property Notes and Applying properties to mineral kits
Mineral Properties: Special Properties	Property Notes and Applying properties to mineral kits
Mineral Identification using the Mineral Properties	Using a dichotomous key to identify minerals
Introduction to Mining	What is mining in Arizona? Notes and Cookie Mining Activity
Processing Minerals and Ores	TBD – Some notes and an activity
Pros and Cons of Mining	Birdseed Mining Activity and Pro and Cons of Mining Notes
PBL Project Workdays	Work on PBL Project artifact for unit
Test Day and Turn in PBL Project	Take test to assess understanding about objectives and concepts covered in unit

Name:

Date:

Period:

Effective Discussion Report Card

Date:

	Not at All	Somewhat	Considerably	Extensively
I took a position, explained it clearly, and use evidence to support my ideas				
I willing answered people's questions about my position, and I respectfully explained or defended my position when asked. I also, asked my classmates to clarify or justify their positions when appropriate				
I listened actively and respectfully to my classmates' positions. I also compared and contrasted their ideas with my own.				
I kept an open mind and was willing to modify my own position				
Throughout the discussion, I summarized in my mind the things that others had said.				
I was actively involved in the conversation				

Date:

	Not at All	Somewhat	Considerably	Extensively
I took a position, explained it clearly, and use evidence to support my ideas				
I willing answered people's questions about my position, and I respectfully explained or defended my position when asked. I also, asked my classmates to clarify or justify their positions when appropriate				
I listened actively and respectfully to my classmates' positions. I also compared and contrasted their ideas with my own.				
I kept an open mind and was willing to modify my own position				
Throughout the discussion, I summarized in my mind the things that others had said.				
I was actively involved in the conversation				

Self-Evaluation Letter Grading Rubric:

10	8	6	4	2
Answers question with correct and relevant information	Answer most of the question with correct and relevant information	Answers some of the questions with correct and relevant information	Answers few questions with correct and relevant information	Answers little questions with correct and relevant information
Elaborate on answer by using different lines of evidence from research	Elaborate on answers by using different lines of evidence from research, but need a little more explanation	Elaborate on answers by using different lines of evidence from research, but needs more explanation	Uses different lines of evidence from research, but doesn't elaborate on answered question	Doesn't elaborate on answers because a lack of different lines of evidence from research
Argumentative paper is written in letter format, appropriate length, uses evidence to support view rather political beliefs, and remains respectful all times in the letter	Argumentative paper is written in letter format, appropriate length, uses evidence to support view rather political beliefs, and remains respectful all times in the letter (one of these points is not followed)	Argumentative paper is written in letter format, appropriate length, uses evidence to support view rather political beliefs, and remains respectful all times in the letter (two of these points is not followed)	Argumentative paper is written in letter format, appropriate length, uses evidence to support view rather political beliefs, and remains respectful all times in the letter (three of these points is not followed)	Argumentative paper is written in letter format, appropriate length, uses evidence to support view rather political beliefs, and remains respectful all times in the letter (four of these points is not followed)
Citations for all used resources and In-text citations are included when paraphrasing, quoting, or mentioning learned materials	2-5 citations and/in-text citations are missing from paper	6-8 citations and/in-text citations are missing from paper	9-10 citations and/in-text citations are missing from paper	More than 10 citations and/in-text citations are missing from paper
Conventions: <ul style="list-style-type: none"> • Times New Roman • 1" margins • Single Spaced • Little to no grammar errors 	Doesn't meet one of mentioned materials or has some grammar errors	Doesn't meet two of mentioned materials or has several grammar errors	Doesn't meet three of mentioned materials or has many grammar errors	Doesn't meet mentioned materials and has numerous grammar errors

Letter Grading Rubric:

10	8	6	4	2
Answers question with correct and relevant information	Answer most of the question with correct and relevant information	Answers some of the questions with correct and relevant information	Answers few questions with correct and relevant information	Answers little questions with correct and relevant information
Elaborate on answer by using different lines of evidence from research	Elaborate on answers by using different lines of evidence from research, but need a little more explanation	Elaborate on answers by using different lines of evidence from research, but needs more explanation	Uses different lines of evidence from research, but doesn't elaborate on answered question	Doesn't elaborate on answers because a lack of different lines of evidence from research
Argumentative paper is written in letter format, appropriate length, uses evidence to support view rather political beliefs, and remains respectful all times in the letter	Argumentative paper is written in letter format, appropriate length, uses evidence to support view rather political beliefs, and remains respectful all times in the letter (one of these points is not followed)	Argumentative paper is written in letter format, appropriate length, uses evidence to support view rather political beliefs, and remains respectful all times in the letter (two of these points is not followed)	Argumentative paper is written in letter format, appropriate length, uses evidence to support view rather political beliefs, and remains respectful all times in the letter (three of these points is not followed)	Argumentative paper is written in letter format, appropriate length, uses evidence to support view rather political beliefs, and remains respectful all times in the letter (four of these points is not followed)
Citations for all used resources and In-text citations are included when paraphrasing, quoting, or mentioning learned materials	2-5 citations and/in-text citations are missing from paper	6-8 citations and/in-text citations are missing from paper	9-10 citations and/in-text citations are missing from paper	More than 10 citations and/in-text citations are missing from paper
Conventions: <ul style="list-style-type: none"> • Times New Roman • 1" margins • Single Spaced • Little to no grammar errors 	Doesn't meet one of mentioned materials or has some grammar errors	Doesn't meet two of mentioned materials or has several grammar errors	Doesn't meet three of mentioned materials or has many grammar errors	Doesn't meet mentioned materials and has numerous grammar errors