
Intro Physical Geology Labs
minerals & rocks
mailto:sbrande@uab.edu
Portal Online Now
geonline.georockme.com
Earth Educators' Rendezvous
Online, July 13-17, 2020
Scott Brande Dept. of Chemistry UAB

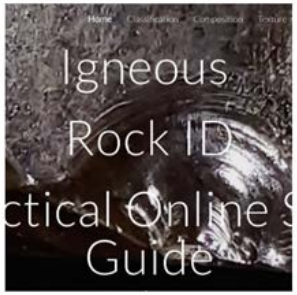
Flipped Talk – 13 Minutes to Go

- PDF & docs with links are available SERC & GDrive

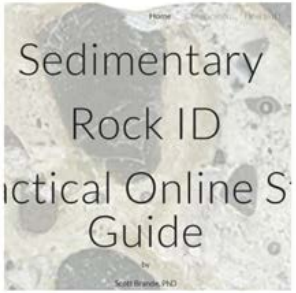
Bottom Line Points - 1

- 4 websites for Intro Physical labs: minerals & rocks

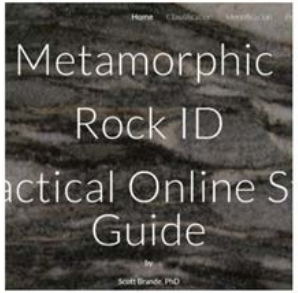
minerals



igneous rx



sedimentary rx



metamorphic rx

- Websites are not labs – toolkits with resources
- Roll-your-own labs with easy-to-copy links from websites

Flipped Talk – 13 Minutes to Go

- PDF & docs with links are available SERC & GDrive

Bottom Line Points - 2

- Free/24/7/365 access, web responsive all devices
- Constant updating – tell me what you need
- Write me for unknowns answer keys (see docs) & questions

mailto:sbrande@uab.edu

Free Resources Under Creative Commons

- Copy links to resources
- Remix into your own lab write-up
- Include CC license (in footnote, example below)

BY – credit author
NC – non-commercial
SA – share alike

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Contact: mailto:soskarb@gmail.com

Colleagues Share Labs Using omg.georockme.com

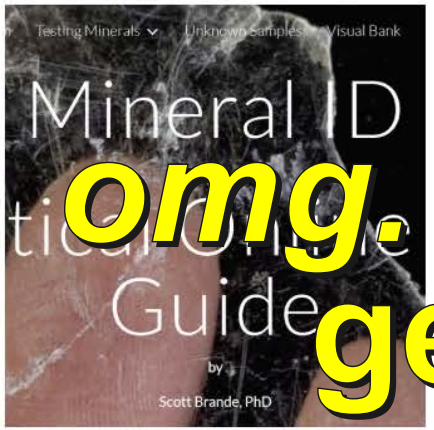
Websites

Examples of Lab Write-Ups - Downloadable

please respect credit

Carolina L. Michel, Chandler-Gilbert Community College, Chandler, AZ
Julia M. G. Miller, Belmont University, Nashville, TN
Patricia Gallagher, Drexel University, Philadelphia, PA
Alexander Zekulin, Brookhaven College & Tarrant County College, Ft. Worth, TX
------- Correspondents ----------
Chris Berg, Orange Coast College, Costa Mesa, CA
Vince Cronin, Baylor University, Waco, TX
Hillary Goodner, Yakima Valley College, Yakima, WA
Wendi Williams, South Texas College, McAllen, TX
& etc.

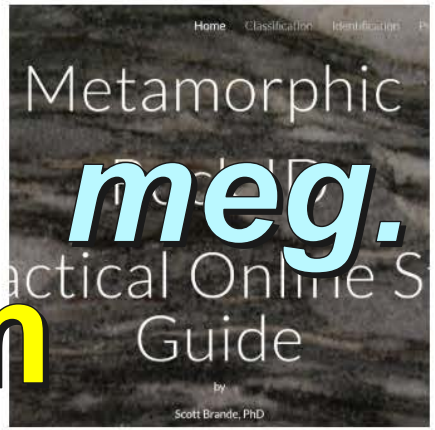
Current Toolboxes



minerals

igneous rock

sedimentary rock

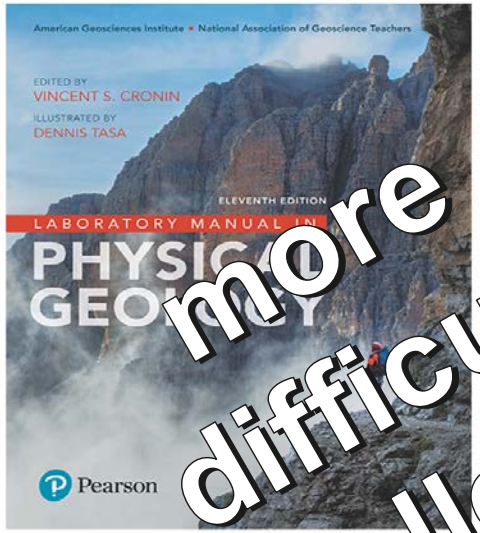


metamorphic rock

omg. igg. seg. meg.
georockme.com

Introductory Geology Labs – How to Classify re:Online

"Sample" Labs – mins/rocks



Laboratory Manual in Physical Geology, 11e

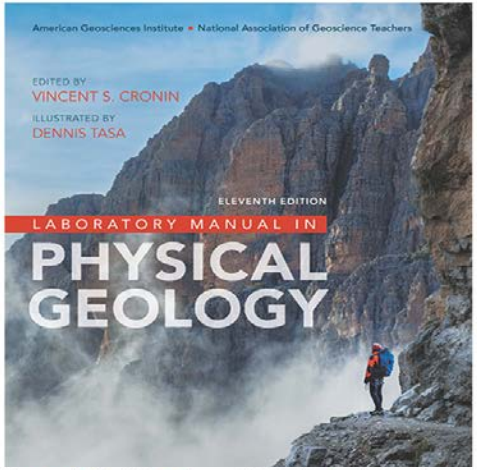
Image PPTs

Chapter 3

Mineral Pr… ies, Identific… Uses

more difficult challenge

"Workbook" Labs – maps

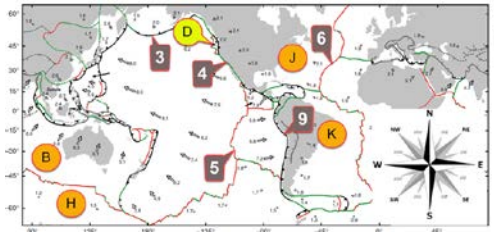


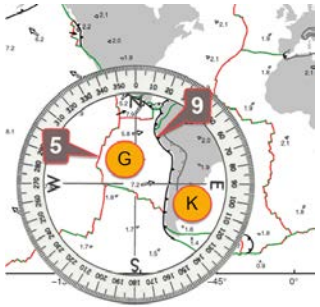
Laboratory Manual in Physical Geology, 11e

Image PPTs

Chapter 2

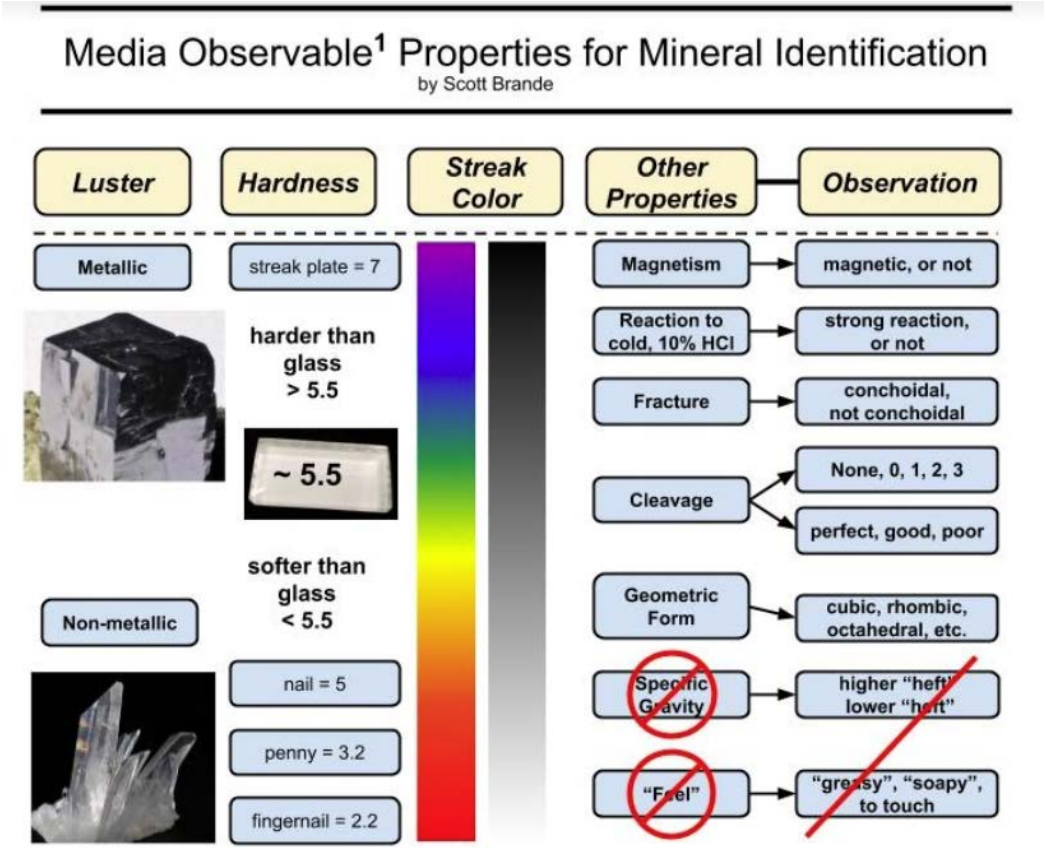
Plate Tectonics





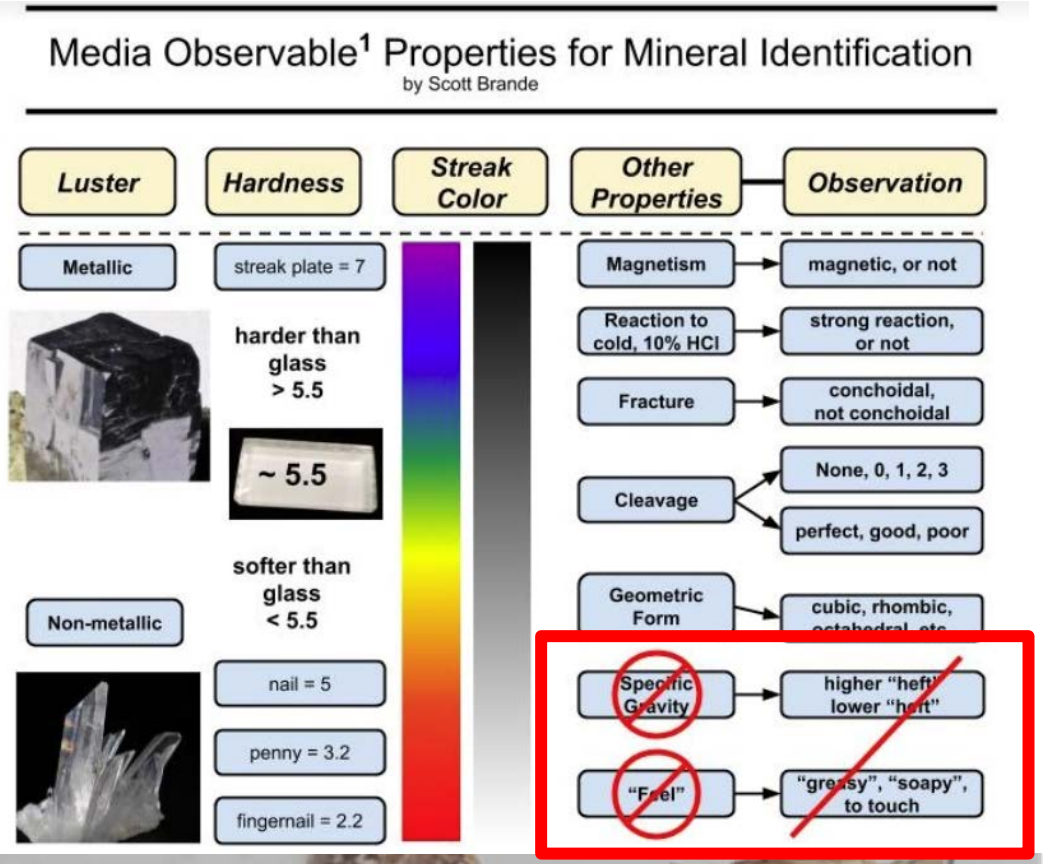
Re-Imagining Online Lab Identification Activity

What physical properties are necessary for identifying a common mineral?



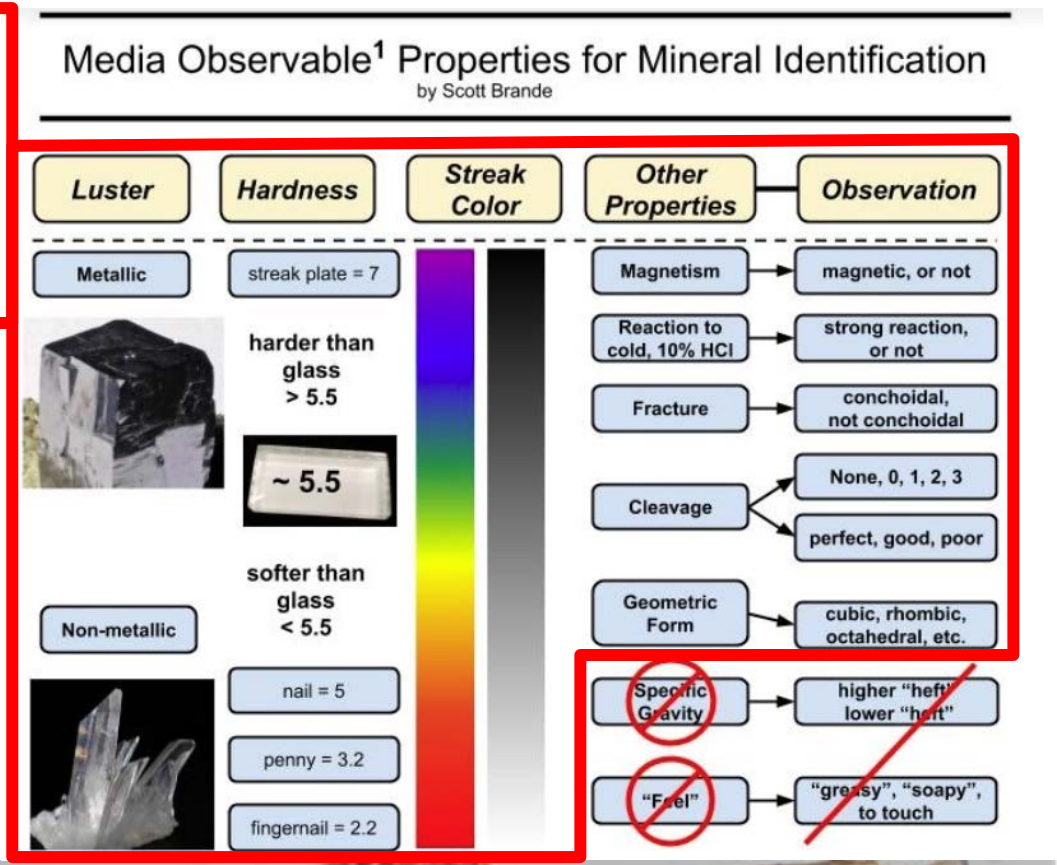
Some Properties Not Diagnostic for Identification

- A few properties are NOT online accessible (easily)



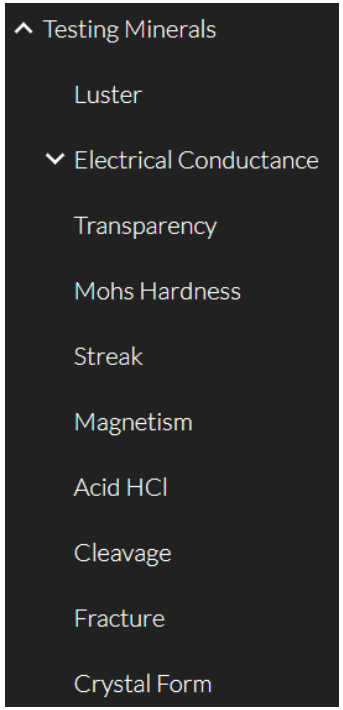
Diagnostic Properties Are Media-Observable

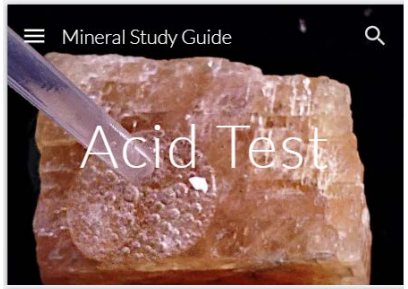
- MOST other properties needed for identification are media-accessible by images / videos / text

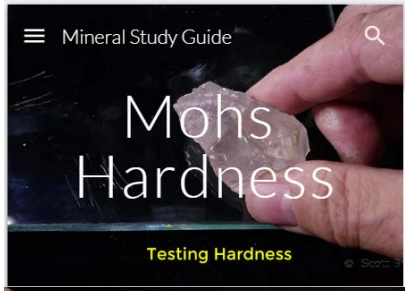


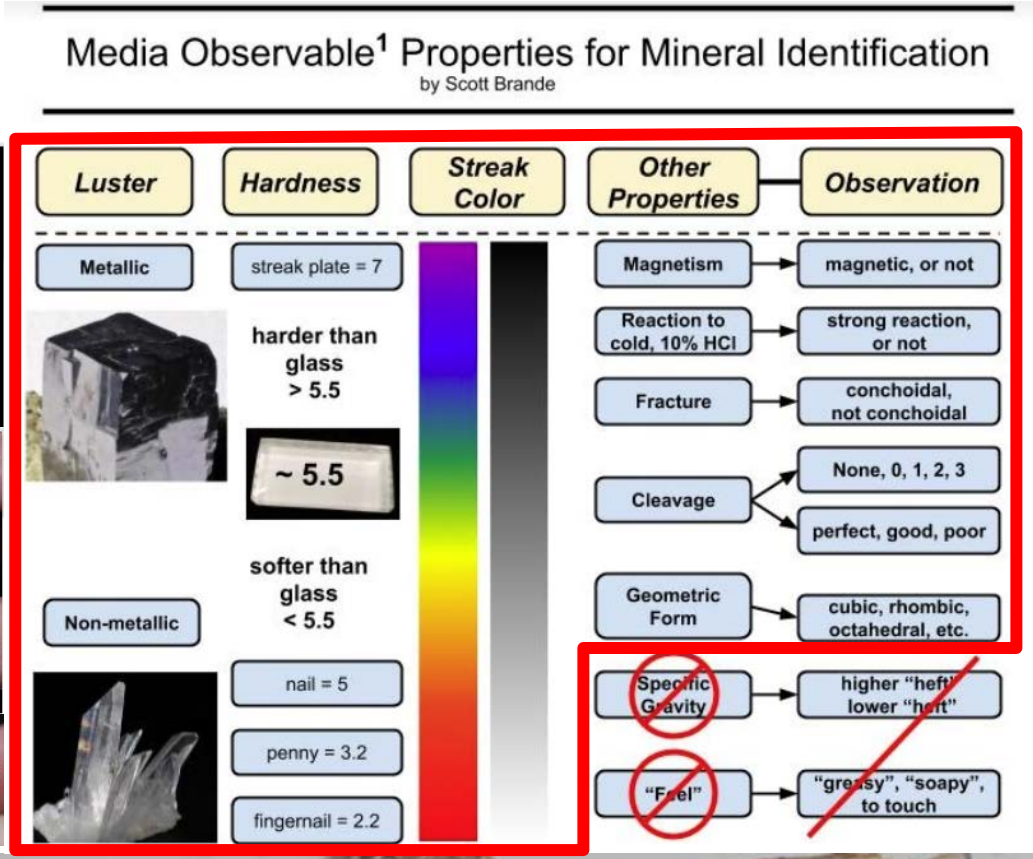
Minerals Online omg.georockme.com

website media







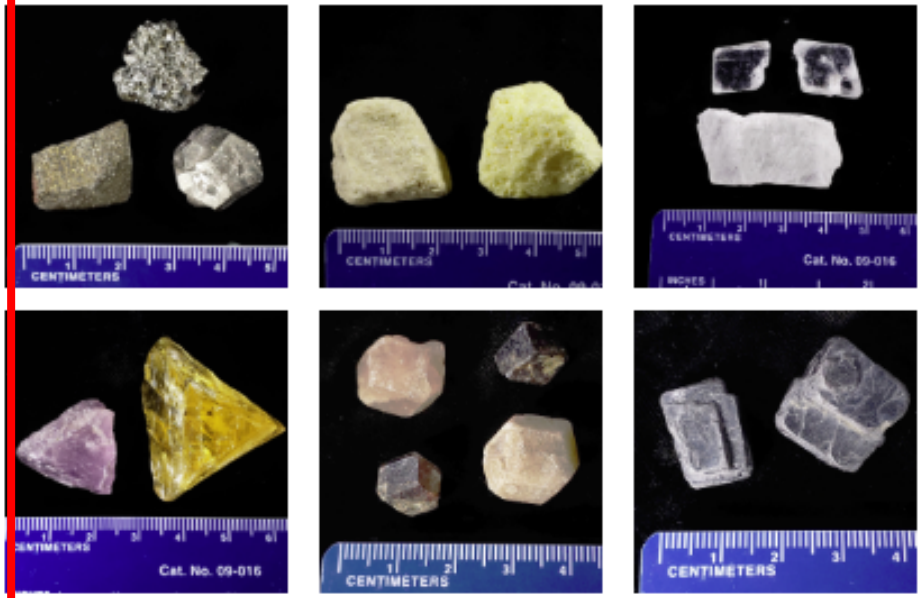


Learning Objectives Should Drive Resources

"For an unknown sample, you will be able to…"

Traditional Hands-on

- report an observation ("does this sample exhibit cleavage?"
- perform and interpret a test (e.g., "is this sample harder than glass?"
- identify a sample by name
- state its chemical formula



Learning Objectives Should Drive Resources

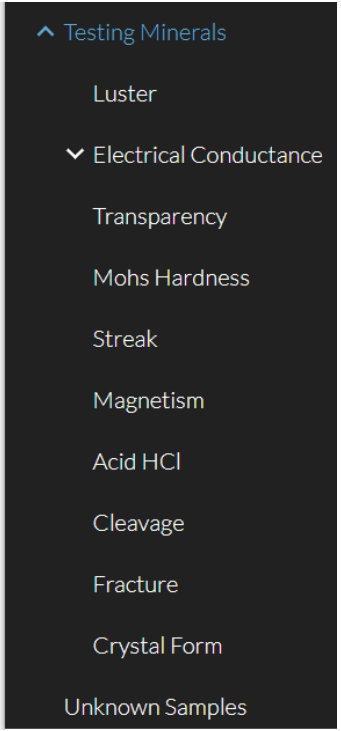
"For an unknown sample, you will be able to…"

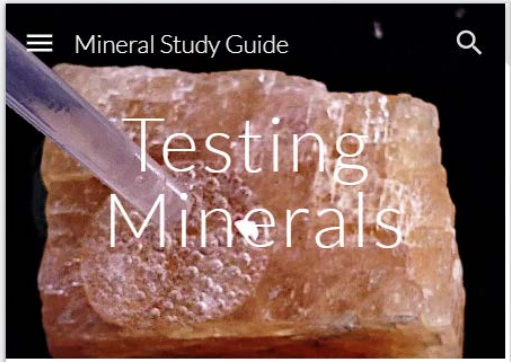
Add Online Activities

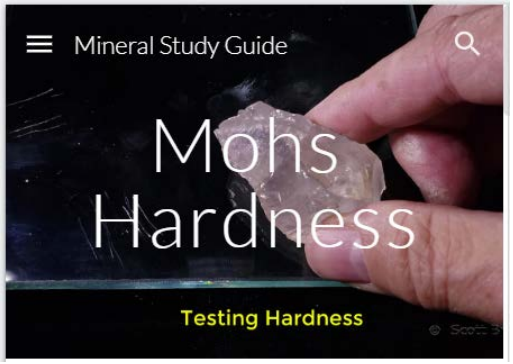
- interpret an observation of a test (e.g., "is this sample harder than glass?"
- identify the sample by name
- state its chemical formula
- describe applications/uses of the mineral

omg.georockme.com Features – Media Shows Testing

- Media-rich – images and videos







transparency

Features – Unknowns & Knowns

Features – Online Digital Bank

Pop-out the Mineral Bank

Click table to display in a new browser tab.

Mineral Bank	Properties						
Name (alphabetical order) (web linked, with *text* and *images*)	*Luster? (NM=non-metallic; M=metallic).* ***Note 1.***	*Hardness - scratches glass plate?* ***Note 2.***	*Streak color?* ***Note 3.***	*"Typical" bulk color?* ***Note 4.***	*Magnetic?*	*Reacts with HCl?*	*Conducts electricity?*
bauxite	NM	no	white (stained)	variable, tan, orange, reddish, etc.	no	no	no
				very dark green,			

Activity - Minerals
U.S. Navy SEAL Gear

Page 1

Chemistry of Globally Sourced Commodities Used in U.S. Navy SEAL Gear
Illustrations from USGS, GIP 183: https://pubs.er.usgs.gov/publication/gip183

How reliant is the US for critical materials used in the manufacture of this high tech gear?

Note all the U.S. Navy SEAL Gear – night vision goggles, GPS, communications gear, M4 carbine, ammunition, infrared strobe, batteries.

Many different minerals are mined to produce critical components in the gear.

Study the following graphics (or access the publication on the web) and then answer questions that follow.

Activities

How Much Does Your Driveway Cost?

"Crushed stone, one of the most accessible natural resources, is a major basic raw material used by construction, agriculture, and other industries that utilize complex chemical and metallurgical processes. Despite the low value of its basic products, the crushed stone industry is a major contributor t and an indicator of the economic well-being of the Nation." (https://www.usgs.gov/centers/nmic/crushed stone-statistics-and-information)

Mineral Resource Demand

The lab activity introduces you to the importance of minerals in our nation's economic activity. You will learn about the uses, demand for, and value of, non-fuel mineral resources.

- **What Are Differences Between Resources and Reserves?**
- **National Demand Resource**

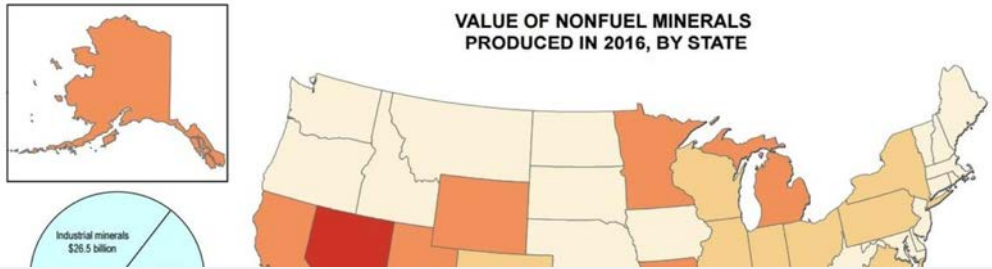
What is lithium?

Instructions: Read the description of the element lithium, and then fill in the empty boxes and missing label with terms from the reading.

From Wikipedia (https://en.wikipedia.org/wiki/Lithium)

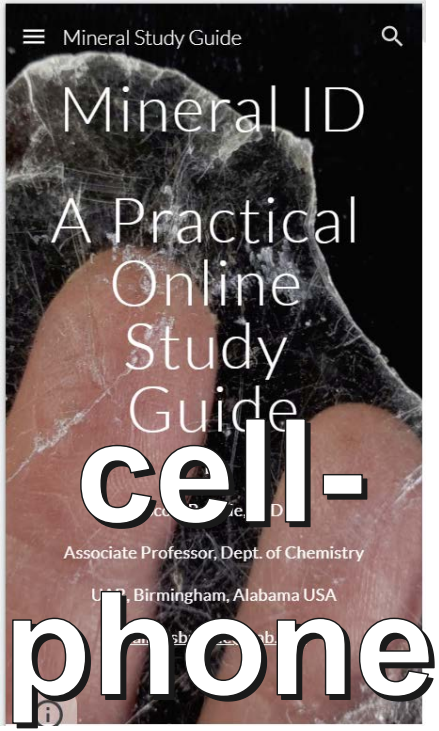
Lithium (from Greek: λίθος *lithos*, "stone") is a chemical element with symbol **Li** and atomic number 3. It is a soft, silvery-white metal. Under standard conditions, it is the lightest metal and the lightest solid element. ...lithium is highly reactive and flammable... It never occurs freely in nature, but only in (usually ionic) compounds, such as pegmatitic minerals which were once the main source of lithium. Due to its solubility as an ion, it is present in ocean water and is commonly obtained from brines.

2016 Value of Nonfuel Minerals by State



Website Features – Device/Browser Agnostic

responsive web re-formatting



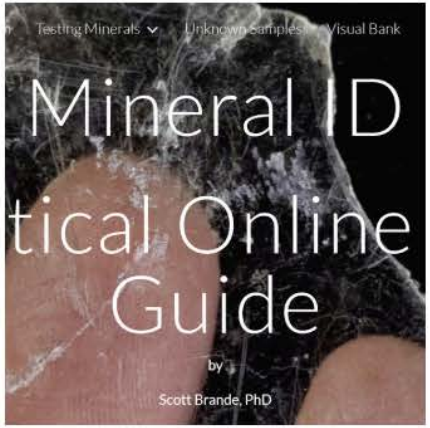
laptop, iPad, chromebook…

cell-phone

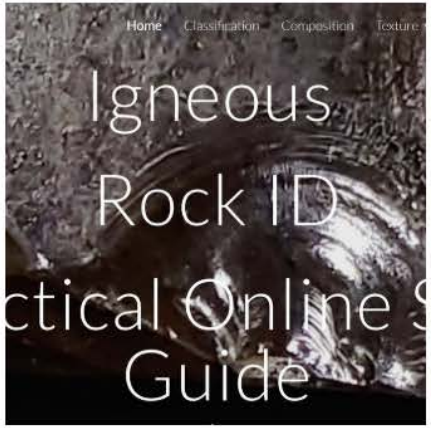
instructor portal: geonline.georockme.com

GeOnline Resources

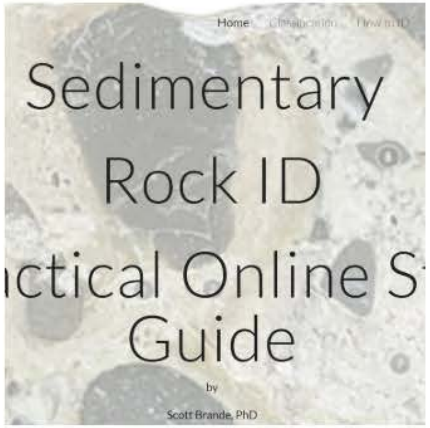
Current Toolboxes



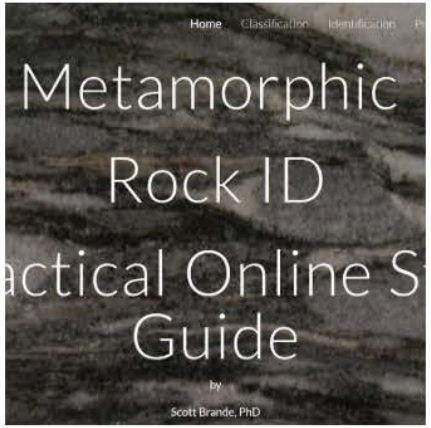
minerals



igneous rock



sedimentary rock



metamorphic rock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