

Critical Mineral Basics

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Critical minerals are mineral resources that are essential to the economy and whose supply may be disrupted. The 'criticality' of a mineral changes with time as supply and society's needs shift. Table salt, for example, was once a critical mineral. Today, many critical minerals are metals that are central to high-tech sectors. They include the rare earth elements and other metals such as lithium, indium, tellurium, gallium, and platinum group elements.

Why do critical minerals matter?

By definition, critical minerals are essential for society. Demand for critical minerals such as rare earth elements has increased in recent years with the spread of high-tech devices for personal and commercial use such as wind turbines, solar panels, and electronics such as smartphones and tablets.

How does geoscience help inform decisions about critical minerals?

Geoscientists study the formation of critical minerals; explore for and locate them; help determine how to mine them economically, safely, and with minimal environmental impact; help protect water and ecological resources around the mines; and help reclaim disturbed land after mining.

Learn More

Introductory Resources

- Rare Earth Elements Background (Webpage), *Wyoming State Geological Survey*
A precise definition of rare earth elements (REEs) and in-depth discussion of how common REEs are, worldwide REE production, and current REE production.
- Minerals, Critical Minerals, and the U.S. Economy (Report), *National Research Council*
2008 report that provides background on what defines a "critical" mineral and proposes a strategy for defining and tracking critical minerals at the federal level.
- Critical Materials Strategy Summary (Factsheet), *U.S. Department of Energy*
2010 Summary of the U.S. Department of Energy's Critical Materials Strategy, assessing the criticality of mineral resources necessary for advancing clean energy technologies.
- Comparison of U.S. Net Import Reliance for Nonfuel Mineral Commodities - A 60-Year Retrospective (1954-1984-2014) (Factsheet), *U.S. Geological Survey*
2015 factsheet describing how U.S. import reliance has increased since the 1950s, and showing how the countries on which the U.S. relies for mineral imports have changed or become more or less important.

Resources for Educators

- Education Resources Network, *AGI's Center for Geoscience & Society*
Search for critical mineral resources in: Organizations, Curricula & Instruction, Teaching Media, Outreach Programs
- NGSS Performance Expectations, *Next Generation Science Standards*
K-ESS3-1, 4-ESS3-1, MS-ESS3-1, HS-ESS3-1, HS-ESS3-2
- NGSS Disciplinary Core Ideas, *Next Generation Science Standards*
ESS3.A

Frequently Asked Questions

Which mineral commodities used in the United States need to be imported?

American Geosciences Institute

How do we use rare earth elements?

U.S. Geological Survey

What are critical minerals, and why are they important?

U.S. Geological Survey

What are rare earth elements, and why are they important?

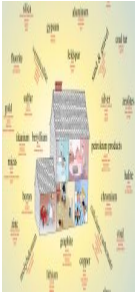
U.S. Geological Survey

Are rare earth elements the only critical mineral resources?

U.S. Geological Survey

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Maps & Visualizations



Visualization of the mineral resources in everyday objects

U.S. Geological Survey

The U.S. Geological Survey has produced a visualization entitled, "Mineral Resources...out of the ground...into our daily lives", which details the mineral resources used to produce everyday items that we use in our homes, on our person, and out in the world. This visualization gives the major...

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