Metals

Metals are found in many different places around the world. Many natural Earth processes affect their distribution and abundance. Metals are essential to our economy and lifestyle, and the global demand for metals continues to rise.

Basics

Metals occur in many different geologic settings around the world. If enough metal is concentrated in one place to be of economic value, it is called an ore deposit. Well-known metals include copper, iron, gold, aluminum, manganese, and platinum, but nearly all of the sixty or so metals in the periodic table have practical uses. Geoscientists know that different types of ore deposits occur in areas where particular types of geologic processes have taken place.

Frequently Asked Questions

What is biomining?
American Geosciences Institute

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 happens before, during, and after mining?
American Geosciences Institute

How can metal mining impact the environment?
American Geosciences Institute
Critical Minerals
Critical minerals are those that are essential to the economy and whose supply may be disrupted. Critical minerals also tend to be those on which a country is heavily import-reliant, so the minerals that are deemed critical will vary from country to country. Demand for many of these minerals has skyrocketed in recent years with the spread of high-tech devices that use a wide variety of materials.

Industrial Minerals
Industrial minerals are non-metals including crushed rock, sand, and gravel. They are essential for construction of buildings and highways, and are used in many household products and industrial processes.

Mineral Resources
Global demand is rising for mineral resources of all kinds, including metals, industrial minerals, and solid fuels like coal. Mineral resources are unequally distributed around the globe, reflecting the vast differences in geology of different parts of the Earth. Geoscientists play an essential role in locating mineral resources and designing processes for their safe extraction.

Mining
Mining is essential to meet rising global demand for minerals. Geoscientists locate mineral resources and figure out how to extract them economically while minimizing health and environmental impacts. The method of mining, as well as potential environmental impacts, depends on the type of resource being mined.
Interactive map of underground mines in Minnesota
Minnesota Department of Natural Resources

The Minnesota Department of Natural Resources provides an interactive map of underground mines in Minnesota. The map provides detailed information on underground mines and their relationship to overlying surface features. Specifically, this map focuses on iron mines in the northeast of the state.

Case Studies & Factsheets

Geologic maps and mineral resources in Nevada
Geologic maps have provided the key to finding new gold deposits in Nevada. Defining the Problem The western states contain many gold deposits (Fig. 1), and a zone of faulted sedimentary and igneous rocks in northeastern Nevada, known as the “Carlin” trend, is the most productive region in the...

Webinars & Forums

Tracking the Global Supply of Critical Materials
This webinar focuses on U.S. and European Union (EU) efforts to gather information and develop tools that can be used to ensure a secure national and global supply of mineral resources; identify and quantify vulnerabilities in this supply; and stimulate national and international co-operation,...