



# EARTH SCIENCE TEACHER RESOURCES

## AGENCIES

### **Environmental Quality Board**

[www.eqb.state.mn.us/environmental-review/overview](http://www.eqb.state.mn.us/environmental-review/overview)

### **Minnesota Department of Natural Resources**

[www.dnr.state.mn.us/education/geology/digging/index.html](http://www.dnr.state.mn.us/education/geology/digging/index.html)

[www.dnr.state.mn.us/lands\\_minerals/index.html](http://www.dnr.state.mn.us/lands_minerals/index.html)

### **Minnesota Pollution Control Agency**

[www.pca.state.mn.us](http://www.pca.state.mn.us)

### **School Trust Lands**

[www.mn.gov/school-trust-lands](http://www.mn.gov/school-trust-lands)

### **United States Geological Survey (USGS)**

[geonarrative.usgs.gov/mrs\\_mineral\\_deposits](http://geonarrative.usgs.gov/mrs_mineral_deposits)

## ASSOCIATIONS

### **American Exploration & Mining Association (AEMA)**

[www.miningamerica.org](http://www.miningamerica.org)

### **American Geophysical Union**

[eos.org/features/new-insights-into-north-americas-midcontinent-rift](http://eos.org/features/new-insights-into-north-americas-midcontinent-rift)

[www.sciencedirect.com/science/article/abs/pii/S0040195118302646](http://www.sciencedirect.com/science/article/abs/pii/S0040195118302646)

### **Geological Society of America**

[www.geosociety.org/GSA/Publications/GSA/Pubs/GSA\\_Publications.aspx](http://www.geosociety.org/GSA/Publications/GSA/Pubs/GSA_Publications.aspx)

[pubs.geoscienceworld.org/gsa/geosphere/article/11/5/1607/132302/North-America-s-Midcontinent-Rift-When-rift-met](http://pubs.geoscienceworld.org/gsa/geosphere/article/11/5/1607/132302/North-America-s-Midcontinent-Rift-When-rift-met)

### **Initiative for Responsible Mining Assurance (IRMA)**

[www.responsiblemining.net](http://www.responsiblemining.net)





## ASSOCIATIONS

### **International Council on Mining and Metals (ICMM)**

- [www.icmm.com](http://www.icmm.com)

### **International Energy Agency**

- [iea.blob.core.windows.net/assets/7771525c-856f-45ef-911d-43137025aac3/SustainableandResponsibleCriticalMineralSupplyChains.pdf](http://iea.blob.core.windows.net/assets/7771525c-856f-45ef-911d-43137025aac3/SustainableandResponsibleCriticalMineralSupplyChains.pdf)
- [www.iea.org/reports/the-role-of-critical-minerals-in-clean-energy-transitions](http://www.iea.org/reports/the-role-of-critical-minerals-in-clean-energy-transitions)

### **Iron Mining Association (IMA)**

- [www.taconite.org](http://www.taconite.org)
- [www.minnesotairon.org](http://www.minnesotairon.org)

### **MiningMinnesota – Responsible Development of Natural Resources**

- [www.miningminnesota.com](http://www.miningminnesota.com)

### **Minnesota Geological Survey**

- [cse.umn.edu/mgs/glacial-geology](http://cse.umn.edu/mgs/glacial-geology)

### **National Mining Association (NMA) - Minerals Make Life**

- [www.mineralsmakelife.org](http://www.mineralsmakelife.org)

### **Society of Mining, Metallurgy, and Exploration (SME) - Minerals Education Coalition**

- [www.mineralseducationcoalition.org](http://www.mineralseducationcoalition.org)

## BOOK

### **Minnesota's Geology**

- [www.upress.umn.edu/book-division/books/minnesotaas-geology](http://www.upress.umn.edu/book-division/books/minnesotaas-geology)

## MINERAL & MINING PODCAST

### **Society of Economic Geologists**

- [www.segweb.org/SEG/Events/SEG/Events/Discovery-to-Recovery-Podcast.aspx](http://www.segweb.org/SEG/Events/SEG/Events/Discovery-to-Recovery-Podcast.aspx)

## MINNESOTA'S GEOLOGY

- [asm.org/articles/2022/february/the-great-oxidation-event-how-cyanobacteria-change](http://asm.org/articles/2022/february/the-great-oxidation-event-how-cyanobacteria-change)





## MINNESOTA'S GEOLOGY

- [www.lakesuperiorgeology.org](http://www.lakesuperiorgeology.org)
- [www.mprnews.org/episode/2023/01/18/the-science-behind-minnesotas-iron-range](http://www.mprnews.org/episode/2023/01/18/the-science-behind-minnesotas-iron-range)
- [www.nature.com/articles/504024a](http://www.nature.com/articles/504024a)
- [www.sciencedirect.com/topics/earth-and-planetary-sciences/banded-iron-formation](http://www.sciencedirect.com/topics/earth-and-planetary-sciences/banded-iron-formation)

## MINNESOTA'S MINING COMPANIES

### Ferrous

- [www.clevelandcliffs.com](http://www.clevelandcliffs.com)
- [www.ussteel.com](http://www.ussteel.com)

### Non-Ferrous

- [www.newrangecoppernickel.com](http://www.newrangecoppernickel.com)
- [www.pulsarhelium.com](http://www.pulsarhelium.com)
- [www.talonmetals.com](http://www.talonmetals.com)
- [www.twin-metals.com](http://www.twin-metals.com)

### Resources from Mining Companies

- [www.teck.com/media/Visualizing-Copper-Demand-in-a-Renewables-Powered-Future.pdf](http://www.teck.com/media/Visualizing-Copper-Demand-in-a-Renewables-Powered-Future.pdf)
- [www.teck.com/media/Teck-Resources-Visualizing-Coppers-Role-in-a-Low-Carbon-Economy.pdf](http://www.teck.com/media/Teck-Resources-Visualizing-Coppers-Role-in-a-Low-Carbon-Economy.pdf)

## ADDITIONAL RESOURCES

### Articles

- [www.minnpost.com/mnopedia/2020/05/a-brief-history-of-minnesotas-mesabi-iron-range](http://www.minnpost.com/mnopedia/2020/05/a-brief-history-of-minnesotas-mesabi-iron-range)
- [www.nrri.umn.edu/research/initiatives/iron-and-minerals-future](http://www.nrri.umn.edu/research/initiatives/iron-and-minerals-future)

### Congressional Testimony

- [www.naturalresources.house.gov/uploadedfiles/dean\\_peterson\\_testimony.pdf](http://www.naturalresources.house.gov/uploadedfiles/dean_peterson_testimony.pdf)

### World Bank

- [www.worldbank.org/en/topic/extractiveindustries/brief/climate-smart-mining-minerals-for-climate-action](http://www.worldbank.org/en/topic/extractiveindustries/brief/climate-smart-mining-minerals-for-climate-action)





## WHY MINE?

### Articles & Resources

- [www.iea.org/news/lack-of-ambition-and-attention-risks-making-electricity-grids-the-weak-link-in-clean-energy-transitions](https://www.iea.org/news/lack-of-ambition-and-attention-risks-making-electricity-grids-the-weak-link-in-clean-energy-transitions)
- [www.irena.org/News/pressreleases/2023/Dec/IRENA-Call-to-Triple-Renewables-by-2030-Becomes-a-Key-Commitment-at-COP28](https://www.irena.org/News/pressreleases/2023/Dec/IRENA-Call-to-Triple-Renewables-by-2030-Becomes-a-Key-Commitment-at-COP28)
- [www.irena.org/Publications/2023/Jun/World-Energy-Transitions-Outlook-2023](https://www.irena.org/Publications/2023/Jun/World-Energy-Transitions-Outlook-2023)
- [www.mn.gov/commerce-stat/pdfs/mn-energy-data-dashboard.pdf](https://www.mn.gov/commerce-stat/pdfs/mn-energy-data-dashboard.pdf)
- [www.msci.com/www/blog-posts/mining-energy-transition-metals/02531033947](https://www.msci.com/www/blog-posts/mining-energy-transition-metals/02531033947)
- [www.ncbi.nlm.nih.gov/pmc/articles/PMC8154355](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8154355)
- [www.npr.org/2024/01/29/1226125617/demand-for-minerals-sparks-fear-of-mining-abuses-on-indigenous-peoples-lands](https://www.npr.org/2024/01/29/1226125617/demand-for-minerals-sparks-fear-of-mining-abuses-on-indigenous-peoples-lands)
- [www.reuters.com/sustainability/climate-energy/cop28-plan-triple-renewables-is-doable-not-easy-companies-say-2023-12-12](https://www.reuters.com/sustainability/climate-energy/cop28-plan-triple-renewables-is-doable-not-easy-companies-say-2023-12-12)
- [www.reuters.com/sustainability/climate-energy/numbers-behind-chinas-renewable-energy-boom-2023-11-15](https://www.reuters.com/sustainability/climate-energy/numbers-behind-chinas-renewable-energy-boom-2023-11-15)
- [www.unfccc.int/process-and-meetings/the-paris-agreement](https://www.unfccc.int/process-and-meetings/the-paris-agreement)
- [www.worldbank.org/en/news/infographic/2019/02/26/climate-smart-mining](https://www.worldbank.org/en/news/infographic/2019/02/26/climate-smart-mining)
- [www.pubdocs.worldbank.org/en/961711588875536384/Minerals-for-Climate-Action-The-Mineral-Intensity-of-the-Clean-Energy-Transition.pdf](https://www.pubdocs.worldbank.org/en/961711588875536384/Minerals-for-Climate-Action-The-Mineral-Intensity-of-the-Clean-Energy-Transition.pdf)

## ONLINE CLASSROOM & VIRTUAL FIELD TRIPS

- [www.digintomining.com](https://www.digintomining.com)

