

**Note: For this chapter, "mineral resource" includes any resource from Earth's crust including petroleum and coal. Grrr... It might be helpful to print this and write your answers by hand while keeping this PDF open to access the included links.*

1. Are minerals renewable or nonrenewable? Explain

2. Look around you. Record 5 things within your field of view made from minerals* AND the mineral/resource that makes up the thing.

| EXAMPLE | DICKEY'S DRINK CUP | PETROLEUM - OIL MAKES PLASTIC |
|---------|--------------------|-------------------------------|
| 1 | _____ | _____ |
| 2 | _____ | _____ |
| 3 | _____ | _____ |
| 4 | _____ | _____ |
| 4 | _____ | _____ |

3. Earth's crust contains _____ tonnes (metric tons) of silver (Ag) & humans use about _____ tonnes / year/

4. If there is *that much* Ag in Earth's crust, why is Ag so expensive? Use the terms *RESERVE* and *RESOURCE* in your answer.

5. Four major categories of mineral resources include...

- | | |
|---|---|
| A | B |
| C | D |

6. The most mined mineral resource is _____ at _____ tonnes/yr. Second is _____ at _____ tonnes/yr.

7. Your text lists 5 responses to limited availability of mineral resources. Which 2 responses would you emphasize if you were *Uber Dictator* & why?

- | | |
|------|---|
| 1 | 2 |
| WHY? | |

7½. Which response would be your LAST choice and why?

8. Why doesn't the US just mine what we need here in the USA? Why do we get mineral resources from other countries?

15.2 - Geology of Mineral Resources

9. From [this map of AZ](#), which mineral resources are the most mined in our home state?

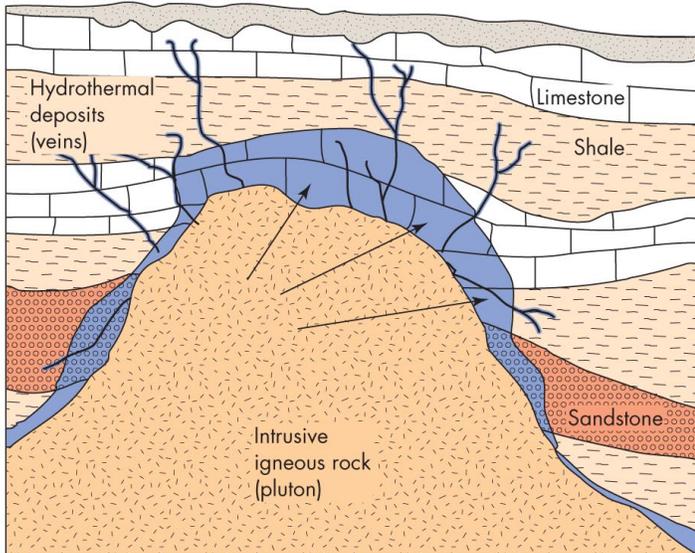
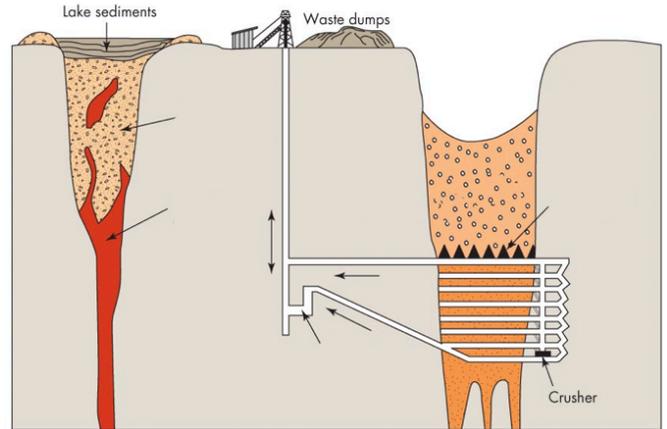
10. From the same map, what do you notice about the occurrence of mineral resources in Northern Arizona? Why might this be?

11. Using the term *concentration factor* in your answer, why are aluminum and iron not very expensive but copper is?

12. Sketch how plate motion leads to concentrating of mineral resources.

13. From Figure 15.8, describe where mercury seems to be concentrated and WHY this is the case?

14. Using this image -> to explain what kimberlite formations have to do with the formation of diamonds.



15. <- How does an igneous intrusion in the form of a pluton concentrate minerals in this formation?

16. Why is limestone in particular often associated with mineral enrichment through contact metamorphism?

17. [This](#) and [this](#) are satellites view of sand and gravel operations in Maricopa County. Why are the mining operations located where they are?

18. Why is gold in particular (and not halite or iron) sometimes mined in placer deposits.

19. Four mineral resources mined as evaporites are _____, _____, _____ & _____

20. In figure 15.7, what must those mineral deposit areas have been like in the past if we are mining gypsum and halite there today?

21. How did all that phosphate in figure 15.10 get concentrated?

22. Do the data in figure 15.3 concern you? Why or why not?

23. What happens over time to create bauxite from soil?

15.3 - Environmental Impact of Mineral Development

24. If mines themselves use only 0.3% of the US surface area, why are we concerned? That's not much? Read all of 15.3 before answering.

25. If you were a mine operator, would you like heap leaching? If you were a nearby homeowner raising your kids? Explain why.

26. Briefly summarize the effects of mining on the following. Use *A Closer Look: Mining and Toxicity* on page 525.

WATER

LAND

ANIMALS

AIR QUALITY

SOCIETY

27. Are environmental regulations related to mines good for bad? Give examples to support your conclusion. (There are plenty in the text.)

28. Describe what the Homestake Mine of South Dakota did to reduce their environmental problem.

15-4 - Recycling Mineral Resources

29. The metals most commonly recycled in the US are _____, _____, _____, _____, & _____

15-5 - Minerals and Sustainability - You already addressed this section in question 7. Relax. Be familiar with the terms below.

ore*
salt dome
country rock
Kimberlite pipe
sedimentary rock
secondary enrichment

bauxite
evaporite
igneous rock
placer deposits
metamorphic rock
contact metamorphism

reserve*
pegmatite
crystal settling
sulfide deposits
concentration factor
regional metamorphism

resource
aggregate
heap leaching
desert pavement
hydrothermal deposit

