Mineral Resources Film Review Name _____

The Global Supply of Critical Materials: Assessing and Tracking Critical Mineral Commodities

1 Modern technology makes use of a very small number of elements in the periodic table. True / False

2. In the given example, cell phones use ??? elements in the periodic table? 1-5 / 10-12 / 15-18 / 20-26 / 30-39

3. Which of the following examples contain exotic/critical elements? There may be more than one correct answer.
cell phones / thin-film solar photovoltaic cells / night-vision goggles / CT diagnostic imaging system / electric vehicles

4. Demand for new technologies is driving the increase in production of critical mineral and material commodities. T / F

5. Which of the following are true?
a. Rhenium is a byproduct of molybdenum and copper.
b. Gallium is a byproduct of zinc.
c. Indium is a byproduct of copper.
d. Bauxite is a byproduct of molybdenum.
e. None of these metals are byproducts.

6. Which country is responsible for production of the largest share of critical mineral commodities? a. Brazil
b. Chile c. China d. Canada e. United States f. Russia

7. In 2014, how many mineral commodities had at least a 50% net import reliance? 10 / 20 / 30 / 40 / >40

8. Which of the following had a 100% net import reliance in 2016? There may be more than one.
Arsenic / Scandium / Rubidium / Barite / Tellurium

9. Which of the following variables were included in the NSTC's criticality assessment model? May be more than one.
a. concentration of supply in countries of low governance
b. concentration of demand in third world countries
c. increase of production as a proxy for increasing demand & importance
d. price volatility
e. lawsuits against mineral producers

10. Criticality assessments are only useful in retrospective analyses of supply disruptions. T / F

11. In the tantalum example, what is the reason for the reduction in the end-of-life recycling rate?
a. over production of tantalum.
b. increased demand for tantalum.
c. a shift from heavily recycled products, such as carbides and mill products,-less recycled products, such as electronics.
d. increase in the recycled content rate.
e. decreasing supply of tantalum.

12. In which stage of the waterfall model do the majority of losses occur?
primary production / processing / manufacturing / in-use dissipation / downgrading / end-of-life

13. What are hibernating stocks?
a. Products discarded but in the recycling pipeline.
b. Products lost through in-use dissipation.
c. Products that have not been discarded, but are not in use.
d. Products that have temporarily been downgraded.
e. Products that are stockpiled for later use by manufacturers.

14. What percentage of tantalum is still in use today? 5 / 13 / 18 / 21 / 32

15. Economics plays a large role in determining what is and is not recycled. T / F

16. Supply and demand scenario modeling provides insights into which of the following?
a. trends in past availability of a mineral commodity.
b. Potential future shortfalls of a mineral commodity.
c. Identification of valuable mineral commodities on the stock exchange.
d. Changes in manufacturing trends of a mineral commodity.e. Fluctuations in mineral exploration activity of a mineral commodity.

17. Which of the following were key inflection points that changed the landscape of criticality? (More than 1 answer?)
a, Summit where the deal on free market principles was validated.
b. 1993 G7 Summit where 27 new minerals were added-the list of critical raw materials.
d. China's accession into the World Trade Organization in 2001.
e. Passing of the global critical raw materials trade agreement in 2005.
f. NATO's declaration of embargoes on rare earth exports from the Democratic Republic of Congo in 2008.

The Dawn of the Age of Critical Materials: Alex King at TEDx DesMoines

Searching for a Better Future through Sustainable Materials at TEDxBismarck - Chad Ulven

Garbology - William Rathje