*Below is the third homework, with answers, for the InTeGrate Activity “The elements and society: how we need them, where do they come from, and the societal and environmental impacts” by Graham B. Baird, Earth & Atmospheric Sciences, University of Northern Colorado*

The elements and society, Homework III – *with answers*

# Listen to the Fresh Air episode 'National Geographic' Mines 'The Real Price Of Gold' originally aired on January 8, 2009 located at:

# http://www.npr.org/templates/story/story.php?storyId=99113470

What was used to bribe the war lords? Jack Daniels

What country originally opened the first mine talked about? Belgium

In the high Peruvian Andes, what “fancy” items are for sale on the streets? Televisions

How wide is the Indonesian gold mine? 1 mile

What would all the gold in the world fill? Two Olympic swimming pools

In Indonesia, where are the tailings disposed? Into the sea

How many grams are given to gold smiths for them to make jewelry with? 103 grams

How many grams of jewelry are the gold smiths expected to return? 100 grams

1. Goto http://ngm.nationalgeographic.com/2009/01/gold/randy-olson-photography

Look at all the pictures and read all the captions, answer the questions below.

What element is used to extract gold from the rock in Indonesia as shown? Mercury (Hg)

In about how many years will the mine on the island of Sumbawa run out of gold? 20 years

A 28 pound bar of gold is worth more than? $335,000

About how much a day do the Indonesian farmers make by digging for gold on the river bank? $5 per day

Which country is the top gold consumer? India

If you are interested, you can get more information at the whole National Geographic article located at:

http://ngm.nationalgeographic.com/2009/01/gold/larmer-text

3) Listen to the Fresh Air episode “Today's Slaves Often Work For Enterprises That Destroy The Environment” originally aired on January 20, 2016 located at:

http://www.npr.org/sections/goatsandsoda/2016/01/20/463600820/todays-slaves-often-work-for-enterprises-that-destroy-the-environment

The radio piece starts with discussing mining in what part of the world? “eastern” Congo

As listed, what are the minerals minded? Cassterite and coltan

What is the chemical formula of the first mineral listed? SnO2

Kevin Bales, the interviewee, does not describe the second mineral right, he provides the “common” name for the second mineral, in Wikipedia, look up this “common” mineral name and provide the true name, its chemical formula, and list the elements extracted from the mineral.

(Fe,Mn)Ta2O6 Nb Ta

Where in society are these elements often used? electronics

How about many people (slaves) live at this mine? 20000

What specific product, that you probably have (perhaps in your bag or pocket right now) likely has the elements listed above? Cell phone

Are the women (slaves) treated well at the mine? Yes No

Which act, passed by the U.S., has forced some improvements in the region discussed?

Dodd-Frank

The interview then turns its attention to a second area of the world, what area is this and what is the element mined? Ghana, gold

Are the mining techniques used here “modern”? Yes No

The workers (slaves) that pulverized the quartzite typically suffered from what disease? Silicosis

How long would the workers (slaves) doing the pulverizing typically live after starting work? 18 months-1 year

Which phase of Hg is most dangerous? Solid Liquid Vapor

Is it more than likely that some of the material (elements) used in the product (and others) listed above came from this slave labor? Yes No

According to the Kevin Bales, do we carry some responsibility regarding the existence of the mining done by slaves? Yes No

The interview then moves to focus on the connection between slavery and climate change, plus other topics.

4) Listen to the Morning Edition segment “Amnesty Report: Child Labor Used To Gather Minerals For Gadget Batteries” originally aired on January 20, 2016 located at:

http://www.npr.org/2016/01/20/463680916/amnesty-international-report-child-labor-used-to-gather-minerals-for-gadget-batt

What electronics manufacturer is named early in the piece? Apple

Who is doing the mining? Children

What element is the focus of the mining? Co

This element is predominately used in what? Li-ion batteries

What country is a focus of the radio piece? Congo

Some of the tunnels dug to do the mining start where? In the forest In old mines In houses

Why is the mining done? To make extra money Just to survive Because they are slaves

Companies based out of what country buy the ore and smelt it? China

Is it more than likely that some product you may have use some of this element mined from this country?

Yes No

5) Watch the youtube video, which is a short documentary entitled “The Price of Gold”:

https://www.youtube.com/watch?v=ohrrE1rjzLo

What country does the video focus on? Ghana

Throughout Africa, what country has been a major driving force behind mining there? China

Does this country import workers? Yes No

What element is being minded? Au

What is one of the major (non-mining) industries for the country of focus? chocolate

Does the mining affect this industry? Yes No

Is a lot of mining illegal? Yes No

Are the imported miners well paid? Yes No

Are the miners working in safe conditions? Yes No

For local people, can they make more money mining than by traditional means? Yes No

What color sand held the element of interest? Black

After the Hg was burned off, estimate the size of the metal piece recovered .

pin head pea marble

Does it appear that people associated with the mining have much choice whether they mine with respect to making a living? Yes No

Is the mining just a local problem? Yes No

Who buys most of the mined metal? Ghana government