UNI Environment, Technology and Society Capstone May 2020 Name\_\_\_\_\_\_\_\_\_\_\_\_

**Week 2** - Homework ***75 points***, please complete this then upload it to the individual google drive course folder I made for you. Also please remember to keep this as a word/google doc rather than converting to a pdf. **Due Tuesday May 26**

**Primer Questions** – Please answer these before interacting with any of the Week 2 content, please answer these ‘off the top of your head’ do not research the questions, if you don’t know try to make a ‘best guess’… I am looking for a sentence or two for each of these Primer Questions…

1. Water

A. Where does your drinking water come from?

B. What factors affect the quality of your drinking water?

C. What if any problems does Iowa have with respect to water?

D. How many gallons of water to you think you use per day?

2. Minerals

A. What are minerals?

B. Where do they come from?

C. Why do we need them?

D. How do we get them?

E. What are conflict minerals?

3. Which is more important to humanity minerals or water? (*Looking for a paragraph here*)

**Content found on this webpage** <https://www.exploreiowageology.org/ETS_CapstoneMay4Week.php>

A. Dr. Heinzel - Environmental energy, processes, dynamic change and human influences

B. May 2020 PBS: H2O the Molecule that Made Us - Episode 1, Pulse & Episode 2 – Civilizations

C. Gustavus Adolphus College – Nobel Conference #54, Suzan Simard, Ecology/Environment

D. Readings Obtaining natural resources through mining - 1. New York Times - 2017 in Northern Minnesota, Two Economies Square Off: Mining vs Wilderness by Reid Forgrave AND 2. The Atlantic - Jan. 2020 - 20,000 Feet Under the Sea by Wil S. Hylton

**Content Questions** – The answers to these questions are in the content

A. Heinzel Environmental Intro – List the Big Ideas for this week.

B. Water Documentary

*Episode 1 – Pulse*

\_\_\_\_\_\_1. The origin of water on Earth is best attributed to… (1pt)

A. comets B. formation of minerals & rocks C. rain D. oceans

\_\_\_\_\_\_2. The Earth’s early life\_\_\_?\_\_\_, evolved to use photosynthesis and create increased levels of Oxygen. Life perpetuates the existence of water on Earth. (1pt)

A. moss B. insects C. carbon D. bacteria

3. \_\_?\_\_\_ preserves the earliest evidence of life on our planet. (1pt)

What word goes in the blank? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

4. Jill Farrant’s Dream is? (2 pts)

5. How can Jill’s Dream become a reality? (2 pts)

\_\_\_\_\_\_\_6. The maximum time a seed is known to have gone without germination from water and remained viable is \_\_\_?\_\_\_ years. (1pt)

A. 100 years B. 10,000 C. 30,000 D. 60,000

\_\_\_\_\_and \_\_\_\_\_7. What creates the toxic foam on the Rio Tiete and Iowa Rivers? (1pt)

A. Phosphates

B. Organics

C. Chemicals

D. Sediment

8. How are dragon flies identifying a great understanding of earth systems? What is the most important thing to understand with respect to a Earth Systems approach? (4 pts)

9. What are the two take home messages of Episode one? (2 points)

A.

B.

*Episode Two – Civilizations*

\_\_\_\_\_\_1. Earth the only Planet in our Solar System covered in water, but only \_\_\_?\_\_\_percent of this resources is fresh water. (1pt)

A. one B. five C. ten D. twenty

2. The Scientific Method, Hypothesis vs. Theory (5 pts)

Between 3 minutes 30 seconds and 9 minutes and 45 seconds the documentary discusses the relationships between water and evolution. They use the word theory at 3 minutes and 30 sections and hypothesis at 8 minutes and 30 seconds. Where did the documentary use the incorrect and correct, words of the scientific method Hypothesis vs. Theory, justify your answers. Haven’t had the scientific method in a while, use this website to learn more <https://undsci.berkeley.edu/article/0_0_0/howscienceworks_01>

\_\_\_\_\_3. 2500 years ago Egyptian Priests developed and used Nilometers and cubits to measure (1pt)

A. money B. floods C. harvest/yields D. stars

4. List the rivers that helped the world’s first four major civilizations evolve. (2 pts)

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_5. The way we manipulate water, e.g. dams, is changing the plant. True or False, if true justify your response… (3 points)

6. Use Google Earth to explore the landscape Southwest of North Platte, Nebraska. What pattern do you see? How does this pattern relate to the documentary? What are the connections between Saudi Arabia and the Western U.S.A.? (5 points)

\_\_\_\_\_\_ 7. What percentage of freshwater usage on Earth is used to grow the food we eat? (1pt)

A. 92 B. 82 C. 42 D. 22

\_\_\_\_\_\_ 8. Development of this crop led to disappearance of water in the Aral Sea? (1pt)

A. Corn B. Wheat C. Cotton D. Olives

9. What drove the overuse of water in the Aral Sea? (2 points)

10. Use the following website to calculate your water footprint, (5 points)

<https://www.pbs.org/wgbh/molecule-that-made-us/home/water-footprint/>

A. Document your results

B. Discuss how your results compare to your water usage estimate in the primer questions. Did you find anything that surprised you, yes? What/why?

C. Suzan Simard – The Hidden Pathways of the Otherworld, Gustavus Adolphus College – Nobel Conference #54,

1. Describe an example from your life that follows as closely as possible her spiral of life Balance to Resilience. It doesn’t have to be perfect, but try to briefly touch on as many of the variables within her ‘spiral of life’ as possible (5 points)

2. You should come back to this question once you finish answering questions on the mining section. How does Dr. Simard’s talk join both of our primary topics, Water and Land, Recourses? I am looking for a paragraph here… (5 points)

D. Mining Readings

First – Why do we mine in the first place, Read through the United Stated Geological Survey flyer smartphones. Did you list digital technologies in the primer questions?

Yes or no?

*Northern Minnesota – A Tale of Two Economies*

\_\_\_\_1. This geologic feature responsible for the dense mineralogically diverse rock of Northern Minnesota is called (1 point)

A. Minnesota Subduction B. Midcontinent Rift C. Superior Orogeny D. Ely Greenstone

\_\_\_\_2. A Minnesota Company, Twin Metals, has identified an area rich in copper, nickel, platinum, gold and silver. It is estimated the value of these deposits is over one trillion dollars. Antofagasta has purchased Twin Metals and is applying for permits to mine in Northern Minnesota. The Headquarters of Antofagasta are located in… (1 point)

A. Minnesota B. Texas C. Chile D. Brazil

3. Write two paragraphs from the opposing sides (5 points)

Mining

Environmental

*20,000 Feet Under The Sea*

\_\_\_\_1. The Earth’s oceans are.. (1 point)

A. relatively flat and made of clay and sand

B. similar to Iowa, gentle rolling hills, mixed sediment, clay to boulders

C. a diverse seascape of mountains, slopes, plains, canyons and other features

\_\_\_\_\_2. Scientists divide the depths of our ocean into \_\_\_?\_\_ layers. (1 point)

A. 1 B. 3 C. 5 D. 7

\_\_\_\_\_ 3. Regulations for ocean mining have never been formally established. The United Nations has given that task to an obscure organization known as the,\_\_\_?\_\_\_ housed in Kingston, Jamaica. (1 point)

A. International Seabed Authority (ISA)

B. United Nations Ocean Commission (UNOC)

C. Global Seascape Committee (GSC)

4. Recent studies have revealed that the chemicals used to disperse/clean up an oil spill in the Ocean is \_\_\_A?\_\_ as the oil to animals living 3,000 feet below the surface. Maybe the greatest alarm in recent years has followed the discovery of plastic floating in the ocean. Scientists estimate that \_\_\_B?\_\_\_ of polymer are flushed into the ocean each year, and substantially more of it collects on the bottom than on the surface. (2 points)

A)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

B) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

5) What does the author mean by this statement, “IS THERE ANY WAY TO CALCULATE THE VALUE OF A LANDSCAPE WE KNOW VIRTUALLY NOTHING ABOUT”? (5 points)

Thinking about these two readings together along with the Cellphone Handout and the primer questions.

1. What drives the need for mining? (2 points)

2. Primer question, What are conflict? Does your answer change after reading this article? <https://www.washingtonpost.com/graphics/business/batteries/congo-cobalt-mining-for-lithium-ion-battery/> , if yes how so? What did you learn from this article? (5 points)

3. Can you think of any sustainable solutions that could help bring compromise between pro mining vs. pro environmental viewpoints? (5 points)