Individual Homework #3, Due Tuesday, March 27\textsuperscript{th} at beginning of class

1. Describe the evidence for/against liquid water on Mars.

2. Could life exist on any of the moons of the Gas giant planets? List each moon we talked about in class, whether you think it could or could not have life, and the evidence that supports your choice.

3. How do you know that a rock is not alive? In terms of the properties of life we discussed, clearly describe why a rock does not meet the criteria for being alive.

4. Suppose we found an organism on Earth with the characteristics described below. In light of what we know about current life on Earth, should we be surprised to find such an organism existing? Why or
why not? Explain your reasoning with a short sentence/a few words; your explanation key to receiving full credit.
- A single- celled organism that builds proteins using 45 different amino acids.

- A single- celled organism that lives deep in peat bogs, where no oxygen is available.

- A multicellular organism that reproduces without passing copies of its DNA to its offspring.

- A multicellular organism that can grow and reproduce even in the absence of water.

- A bacterium with cells that lack the molecule ATP.

- A species of archaea that lives in the 1000° C molten rock of a volcano.

- Two different animal species whose genomes are more than 99% identical.
5. What do we mean by an “RNA world,” and why do scientists suggest that such a world preceded the current “DNA world”? Make sure you answer is intelligible to someone who has not studied this topic before!