

**Answer all questions in the space provided. If you have any questions, raise your hand.
100 points possible. NO CALCULATORS OR ANY ELECTRONIC DEVICES.**

1 (4 pts) One of the main themes of this course has been “Geological activity scales with size.” Explain what this means.

2 (10 pts) Explain **why** geological activity scales with size.



3 (8 pts) Explain why a world that is currently geologically active is **much** more likely to have an atmosphere than a world that is not currently geologically active.

4 (8 pts) Explain why counting the number of 10-meter-diameter craters would tell you nothing about the age of a surface on the Earth.



5 (8 pts) Explain how two worlds with the exact same **mass** can have very different surface gravities.

6 (8 pts) Explain why it is possible for **liquid** water to exist on the surface of one world but not on the surface of another world that has the exact same size and gravity.



7 (8 pts) Why do we believe that the outer 100 km of the Moon was once completely molten?

8 (8 pts) The Mars rovers have no mechanism to dig deeply into the surface of Mars. How do they obtain samples that were once deeply buried?



Assume you have collected 1,000 samples, uniformly, over the entire surface of the **Moon**.

9 (4 pts) List the types of the samples you would have in your collection.

10 (6 pts) What would be the most common type of sample in your collection? Explain your reasoning for your answer.

11 (2 pts) What would be the age of the **oldest** sample in your collection? _____

12 (2 pts) What would be the age of the **youngest** sample in your collection? _____

13 (4 pts) What would be the most **common age** of the samples in your collection? _____



Assume you have collected 1,000 samples, uniformly, over the entire surface of **Venus**.

14 (4 pts) List the types of the samples you would have in your collection.

15 (6 pts) What would be the most common type of sample in your collection? Explain your reasoning for your answer.

16 (2 pts) What would be the age of the **oldest** sample in your collection? _____

17 (2 pts) What would be the age of the **youngest** sample in your collection? _____

18 (4 pts) What would be the most **common age** of the samples in your collection? _____

