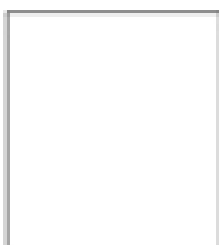


**Answer all questions in the space provided. If you have any questions, raise your hand. 100 points possible. NO CALCULATORS OR ANY ELECTRONIC DEVICES.**

**1 (3 pts)** Apollo 12 landed on a **Mare** surface of the Moon. What type(s) of rock is/are most common at this site?

**2 (3 pts)** Apollo 16 landed on a **Highland** surface of the Moon. What type(s) of rock is/are most common at this site?

**3 (6 pts)** Explain why you can **not** use the same radioactive isotopes to determine the age of Moon rocks as you would use to determine the age of rocks found around Seattle.



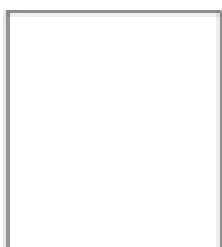
You have discovered a new planet orbiting the Sun at a distance of 0.3 AU. This planet is  $(1/5)$  the size of the Earth, and is  $(1/100)$  as massive. The planet has an uncompressed density of  $5.0 \text{ g/cm}^3$  and a moment-of-inertia factor of 0.30. (Use this information to answer the question on the next two pages).

4 (6 pts) How does the gravity of this planet compare to the Earth's gravity? [Be quantitative; show your work.]

5 (4 pts) What is the most likely composition of this planet? [Remember to give a qualitative indication of the amount of each substance.]

6 (3 pts) Describe how the mass is distributed in the interior of this planet.

7 (6 pts) Would you expect the amount geological activity on this world to be greater or less than the Earth's? Explain your answer.



8 (8 pts) Explain why it is unlikely that this planet has a thick atmosphere today.

9 (8 pts) It is likely that 3 billion years ago this planet *did* have an atmosphere (for a short time). How did this atmosphere form and what was the most likely composition of this atmosphere.

10 (4 pts) Explain why the surface temperature of this world was probably higher 3 billion years ago, than is today.

