

## **ELT HOMEWORK**

### **Chapter 5. Origins of a Habitable Planet: Earth and Moon**

1. What are the sources of heat inside a planet?

The source of heat inside a planet is radioactive energy being released from inside the interior of the planet. This energy is released from the decay of Uranium and other elements.

2. What is the relationship between the Earth and Moon in size?

The diameter of the Moon is 1/4 the diameter of the Earth and 1/80 the mass of the Earth.

3. What is the distance from the Earth to the Moon?

The distance from the Earth to the Moon is 238,855 miles.

4. When did the Apollo missions to the Moon take place? Why did we go to the Moon?

The Apollo missions to the Moon took place in the 1960s. We went to the Moon because everything there was very well preserved. The Moon did not change while Earth is entirely different than it was 200 million years ago and therefore it can be used to learn more about our planet.

5. What are the differences between the lunar highlands and the lunar maria (e.g., composition, age of rocks, topography)?

The lunar highlands are older than the lunar seas. The highlands contain rocks that are at least 4 billion years old. They are known as breccia and were formed by the surface of the Moon melting and re-solidifying. This could have been due to meteors crashing into the Moon. The highlands are thought to have been formed from the Moon's original crust. The lunar seas on the other hand are pools of solidified lava. The rocks that melted in its interior

did so due to radioactive energy. The oldest rocks in the lunar maria are 3.9 billion years old and the youngest rocks are 3.1 billion years old.

6. Why was it so scientifically important to collect lunar rocks?

It is scientifically important to collect lunar rocks because they can tell us whether the surface of the Moon was melted by meteorites or by radioactive energy. We can use this information to tell us how the Moon was formed relative to the Earth.

7. What is the currently accepted view of the origin of our Moon?

The currently accepted view of the origin of our Moon is that it was formed when a body the size of Mars collided with Earth. Material ejected into space from this collision and eventually formed the Moon. It wasn't able to retain its heat so its temperature dropped.

8. How are igneous rocks dated?

Igneous rocks are dated through radioactive decay. We can use this method to determine how long it has been since a rock melted.

9. How are impact craters produced? Why does the Moon have so many visible craters? Where are Earth's craters?

The Moon's impact craters were produced by meteorites. There are so many visible craters because they were well preserved due to environment on the Moon. The Earth's running water and winds wore away its craters, however since the Moon does not have these its craters can last a billion years.

10. What is the relationship between the size of a terrestrial planet and its history of geologic activity?

If a planet is smaller it cannot retain its inner heat. This is related to its geological activity because if it loses its heat it will become geologically dead. This is the case with the Moon as it was too small to retain its heat and lost it to space. It became geologically dead 3 billion years ago.