Activity V: Planets

April 16, 2021

1 Introduction and Objective

In this activity you will answer the following questions regarding the planets in our Solar System. You may refer to the lecture videos, e-book, or, if you like, to any valid web resources. quasi-open-ended

1. List all of the planets in our Solar System in order of their proximity to the Sun.

   (a) Mercury
   (b) Venus
   (c) Earth
   (d) Mars
   (e) Jupiter
   (f) Saturn
   (g) Uranus
   (h) Neptune

2. List all of the planets in our Solar System in order of their average surface temperature.

   (Hottest to coldest)

   (a) Venus
   (b) Mercury

(c) Earth
(d) Mars
(e) Jupiter
(f) Saturn
(g) Uranus
(h) Neptune

3. List all of the planets in our Solar System in order of their radii.

   (Largest to smallest)

   (a) Jupiter
   (b) Saturn
   (c) Uranus
   (d) Neptune
   (e) Earth
   (f) Venus
   (g) Mars
   (h) Mercury

4. Jupiter's moon Europa very likely has a liquid water ocean beneath its icy surface. Why doesn't this liquid ocean freeze?

   Because of the hydrothermal vents underneath the subsurface ocean.

5. List the rocky planets in descending order of their surface pressures (i.e., from highest pressure to lowest).

   (a) Venus
   (b) Earth
   (c) Mars
   (d) Mercury

6. List the rocky planets in descending order of their masses.

(a) Earth

(b) Venus

(c) Mars

(d) Mercury

7. Define the terms planet and dwarf planet.

   Planet: A celestial body that orbits a star and has enough mass to have its own gravity. Planets are neither stars or satellites of other planets.

   Dwarf Planet: A dwarf planet is like a planet with sufficient mass but it's size in diameter must be small compared to other planets' size.

8. The Moon's mass is 0.0123 of Earth's, and its radius is 0.2727 of Earth's. Using this information, determine the surface gravity on the Moon compared to that on Earth.

   Moons gravitational acceleration:

$$a_g = \frac{GM}{r^2} \tag{1}$$

$$a_g = \frac{(6.67408 \times 10^{-11})(7.345806 \times 10^{22})}{(1739.2806)^2} \tag{2}$$

$$a_g = \frac{(4.897114 \times 10^{12})}{(1739)^2} \tag{3}$$

$$a_g = 1.623 \times 10^6 \tag{4}$$

   Therefore, moons gravity is $1.62 m/s^2$. Earths gravity is 9.81 m/s^2. Which means moons gravity is 0.165 that of earth.

9. State three discoveries that Curiosity has made.

   (a) Found large quantities of water on mars.

   (b) Discovered organic molecules in martian rock.

   (c) Detected radiation levels to be too dangerous for humans.

10. If the Moon were 1 mile from Earth, how far from the Earth would Mars be?

    1300 miles.

fill in the blank

1. The main constituent of the Martian atmosphere is Carbon Dioxide
2. The main constituent of Jupiter is Hydrogen
3. The Venusian atmosphere 92 times as thick as Earth's atmosphere (by pressure).
4. With our current technology, it takes about 6 months to get to Mars.
5. There is evidence that Mars currently has an abundance of liquid water on its surface.
6. The four largest moons of Jupiter are Ganymede, Callisto, Io, and Europa
7. The Venusian day lasts for 5832 hours.
8. The planet with the largest day-night fluctuation in temperature is Mercury.
