Name: _____ Period: _____ Date: _____

Planetary Density Practice Problems

Astronomy

Introduction: Planetary density is a big factor when we look at composition and structure. Use the information provided below to help you calculate this.

Formulas:

- Volume $V = \frac{4\pi R^3}{3}$
  - Variable:
    - R – radius of the planet
- Density $D = \frac{M}{V}$

Data:

Using the website (https://solarsystem.nasa.gov/planets/) click on each of the planetary bodies listed and head to "By the Numbers". Find the mass and the radius of each and then place that information in the data table below. Make sure to include units!

Planetary Body	Radius	Mass
Mercury		
Venus		
Earth		
Mars		
Jupiter		
Saturn		
Uranus		
Neptune		
Pluto		
Earth's Moon		

Sun		

Volume Problems:
Complete all of your work below!

1. Mercury:
   R = 2439.7 km
   $V = \frac{4\pi R^3}{3} = \frac{4(3.1416)(2439.7^3)}{3} =$ ***6.08 x 10^{10} km^3***
   Check your answer with the website!

2. Venus:

3. Earth:

4. Mars:

5. Jupiter:

6. Saturn:

7. Uranus:

8. Neptune:

9. Pluto:

10. Earth's Moon:

11. Sun:

Density Problems:
Complete all of your work below!

1. Mercury:

V= 6.08x10^{10}km^3 *M = 3.30 x 10^{23}kg*
D = M/V
D= 3.30x10^{23}kg /6.08x10^{10} km^3
D= 5.427x10^{12}kg/km^3

Conversion: kg/km^3 needs to be converted to g/cm^3

$$\frac{5.427\times10^{12}\text{ kg}}{\text{km}^3} \times \frac{1\times10^{3}\text{ g}}{1\text{ kg}} \times \frac{1\times10^{-15}\text{ cm}^3}{1\text{ km}^3} = \mathbf{5.427\ g/cm^3}$$

Check your answer with the website!

2. Venus:

3. Earth:

4. Mars:

5. Jupiter:

6. Saturn:

7. Uranus:

8. Neptune:

9. Pluto:

10. Earth’s Moon:

11. Sun: