Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Period \_\_\_\_\_\_\_\_\_\_

**Calculating Density**

In order to calculate the density of a substance you must first know its mass and volume. Density is the ratio of mass to volume. The formula for density is **D = M/V** (mass divided by volume). The table below lists some common materials that are found on Earth. Calculate the density of each object and write your answer in the box provided. You may use a calculator.

|  |  |  |  |
| --- | --- | --- | --- |
| **SUBSTANCE** | **MASS** in grams (g) | **VOLUME** in cubic centimeters (cm3) | **DENSITY** in grams per cubic centimeter (g/cm3) |
| Gold | 193.2 g | 10 cm3 |  |
| Oxygen | 1.3 g | 100 cm3 |  |
| Water | 10 g | 10 cm3 |  |
| Helium | 1.7 g | 10,000 cm3 |  |
| Mercury | 67.8 g | 5 cm3 |  |
| Copper | 224 g | 25 cm3 |  |
| Ice | 8.9 g | 10 cm3 |  |
| Gasoline | 10.8 g | 15 cm3 |  |
| Oil | 18.4 g | 20 cm3 |  |
| Iron | 778.4 g | 100 cm3 |  |
| Nickel | 133.6 g | 15 cm3 |  |

1. **Mercury is a metal that is a liquid at room temperature. In the box below, List each of the substances that will float in, on or above mercury.**

Use the formula **M = DV** (mass equals density times volume) to calculate the mass of the following substances:

|  |  |  |  |
| --- | --- | --- | --- |
| **SUBSTANCE** | **MASS** in grams (g) | **VOLUME** in cubic centimeters (cm3) | **DENSITY** in grams per cubic centimeter (g/cm3) |
| Chalk |  | 12 cm3 | 1.1 g/cm3 |
| Chocolate |  | 21 cm3 | 0.6 g/cm3 |
| Cork |  | 28 cm3 | 0.2 g/cm3 |
| Glass |  | 81 cm3 | 2.6 g/cm3 |

1. **Which substance has the greatest mass?**
2. **Which substance has the smallest mass?**
3. **Water has a density of 1 g/cm3. Which of these objects will sink in water?**

Use the formula **V = M/D** (volume equals mass divided by density) to calculate the volume of the following substances:

|  |  |  |  |
| --- | --- | --- | --- |
| **SUBSTANCE** | **MASS** in grams (g) | **VOLUME** in cubic centimeters (cm3) | **DENSITY** in grams per cubic centimeter (g/cm3) |
| Paper | 0.001 g |  | 1.2 g/cm3 |
| Soap | 2.5 g |  | 0.8 g/cm3 |
| Pine wood | 1200 g |  | 0.5 g/cm3 |
| Balsa wood | 357 g |  | 0.2 g/cm3 |

1. **Which substance has the greatest Volume?**
2. **Which substance has the smallest volume?**
3. **Water has a density of 1 g/cm3. Which of these objects will sink in water?**