**What Units Are Used to Express Mass and Volume?**

* What weights more… a kilogram of **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** or a kilogram of **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**?
	+ Answer: **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**.
* There are a number of different ways to **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** matter.
* Scientists rely on **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** and they work very hard to make sure those measurements are as **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** as **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**.

**Weight**

* **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** is a measure of the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** of **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** on an **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**.
* On another planet, the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** of **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** will be **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** if the planet is **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** than Earth and less if the planet is **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** massive than earth.
* On the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** you would weigh **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** you do on Earth.
	+ Calculate your weight on the moon \_\_\_\_\_\_\_\_
* To find **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** you could **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** an object on a **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**.
* The amount of **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** the scale does **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** on the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** of the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**.



**Mass**

* How can you **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** less on the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** than on **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** when **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** about you has **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**?
* Your **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** is **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** on the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** of the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** you are on.
* The **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** of **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** in an **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** is its **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**.
	+ If you travel to another **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** the amount of **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** that makes you up (mass) does not **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**.
	+ Because of this we prefer to describe **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** in terms of **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** rather than **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**.



**Challenge**

* Suppose you are taking a flight to Europe. You are only allowed a 23-kg suitcase. How much is that in pounds? (hint 1 kg = 2.2 lbs)
* Answer = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Volume**

* All **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** has **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** and takes up **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**.
* The amount of **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** that matter occupies is called **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**.
* The **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** unit of volume is the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** (m3).
* In the lab volumes of **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** and **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** shaped **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** are measured using a **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** cylinder.

What is the volume of the suitcase? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**How is Density Determined?**

* Even though a pound of **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** weighs the same as a pound of **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**, they do not **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** the same amount of **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**.
* The volumes differ because **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** and **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** have different **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**.

**Calculating Density**

* **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** is a measure of the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** of a **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** in a given **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**.
* **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** can be expressed as the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** of **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** in one **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** (g/cm3).
* You can determine the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** of a sample of matter by **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** its **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** by its **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**.
* Density = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Sinking or Floating?**

* If you had a **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** of **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** and a **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** of **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** that had **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**.
* When you drop both blocks into a tub of water, you see that the wood **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** and the iron **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**.
* The **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** of water is **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**
* Objects with **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** densities will **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**, and objects with **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** densities will **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**.
* If you watch a bottle that is filled with **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** and **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** you will notice that the substances **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** out.
* This happens because **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** is **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** than **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**.

**Using Density**

* Suppose you are a gold miner in the 1800’s.
* One day, while panning through the sediment in a stream, you come across a shiny golden rock.
* How do you know if it’s **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**?
* You can measure the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** and **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** of the rock and find its **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**.
	+ If it matches **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**, the density of gold, then you have struck it rich.