**Section 1.1 What is Matter?**

1. **Matter**

Matter: anything that has mass and takes up space.

Everything in the Universe you can see is made up of matter.

1. **Matter and Volume**
2. All matter takes up space.
3. The amount of space something takes up is its **volume**.
4. Objects that have volume cannot share the same space. An object cannot be in a spot another object is in unless it moves it out.
5. **Liquid Volume**
6. Liters (L) and milliliters (mL) are units used to most often express the volume of liquids. The volume of any liquid can be expressed in these units.
7. **Measuring the Volume of Liquids**
8. **Graduated cylinders** are used to measure the volume of liquids when accuracy is important (like in science class!)
9. The surface of the liquid in the graduated cylinder is curved. This curve is referred to as the **meniscus**.
10. To measure the volume, you must look at the bottom of the meniscus.
11. **Volume of a Regularly Shaped Solid Object**
12. The volume of any solid object is expressed in cubic units.
13. **Cubic** means “having three dimensions.”
14. Cubic Meters (m3) and Cubic Centimeters (cm3) are the most common.
15. The 3 represents the 3 dimensions, or measurements, used to find the volume.
16. For cubes and rectangular prisms, we use the following formula:

**Volume=Length x Width x Height**

1. **Volume of an Irregularly Shaped Solid Object**
2. Used for objects that are not “regular” like a cube is.
3. Find the amount of water the object **displaces** in a graduated cylinder.
4. Fill a graduated cylinder with water. Place the object in the water. See how much the water rose. **This is your object’s volume.**
5. **1mL=1cm3**
6. **Matter and Mass**
7. All matter has mass.
8. **Mass** is the amount of matter in an object.
9. An object’s mass is the same no matter where it is in the Universe.
10. **The only way to change mass is to change the amount of matter it takes to make the object**.
11. **The Difference between Mass and Weight**
12. **Mass** and **Weight** are two different things.
13. **Weight** is a measure of the gravitational force pulling on an object.
14. **The more mass an object has, the higher the objects weight will be.**
15. An objects weight can change, depending on the gravitational pull on the object.
16. An object would weigh less on the moon because the moon has less gravitational pull than the Earth.
17. **Table on Page 7 gives more details**
18. **Measuring Mass and Weight**
19. The SI unit for mass is the **Kilogram** (kg), but mass is often expressed in **grams** (g) and **milligrams** (mg)
20. Weight is often expressed in **newton** (N), but we also commonly use pounds and ounces.
21. One newton is equal to about 100g on Earth.
22. **Inertia**
23. **Inertia** is the tendency of an object to resist a change in motion.
24. An object not moving will continue to not move until something causes it to move.
25. And object that is moving will keep mobbing until something tries to slow it down.
26. **Mass: The Measure of Inertia**
27. An object that has a large mass is harder to get moving and harder to get to stop moving.
28. An object with a larger mass has a greater inertia.