VOCABULARY

balance – *a tool used to measure mass*

graduated cylinder – *a tool used to measure the volume of liquids*

property – *a characteristic that helps identify a substance*

standard mass – *a small cylinder, labeled with a mass, that is used with a balance to find the mass of other objects*

volume – *the amount of space that something takes up*

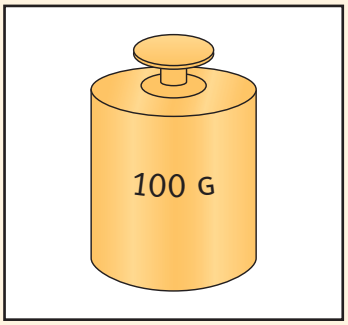
Matter is all around you. Remember, anything that has mass and takes up space is matter. A wooden block, milk, and air are all examples of matter. Although these three things seem very different, they all have mass and take up space.

MASS

Mass is a measurable **property** of matter. This means that you can measure it. Sometimes, people talk about mass and weight as if they are the same thing. However, mass and weight are different. Mass is the amount of material that an object is made up of. Weight is a measure of how hard gravity is pulling on the object. Since the amount of gravity changes based on where an item is, weight can change too. For example, imagine a satellite that is launched into space. The farther the satellite travels away from the earth, the less it weighs. This is because the earth's gravitational pull is not as strong. However, the satellite's mass stays the same.

To measure mass, scientists use a **balance**, like the one pictured below. To find out how much mass an object has, place it on one side of the balance. On the other side, place objects with known masses, like a **standard mass**. A standard mass is a small cylinder, labeled with a mass, that is used with a balance to find the mass of other objects. When the two sides are balanced, or equal, you will know the mass of the object you are measuring.

A balance is used to measure mass.



A standard mass is used with a balance to measure mass.

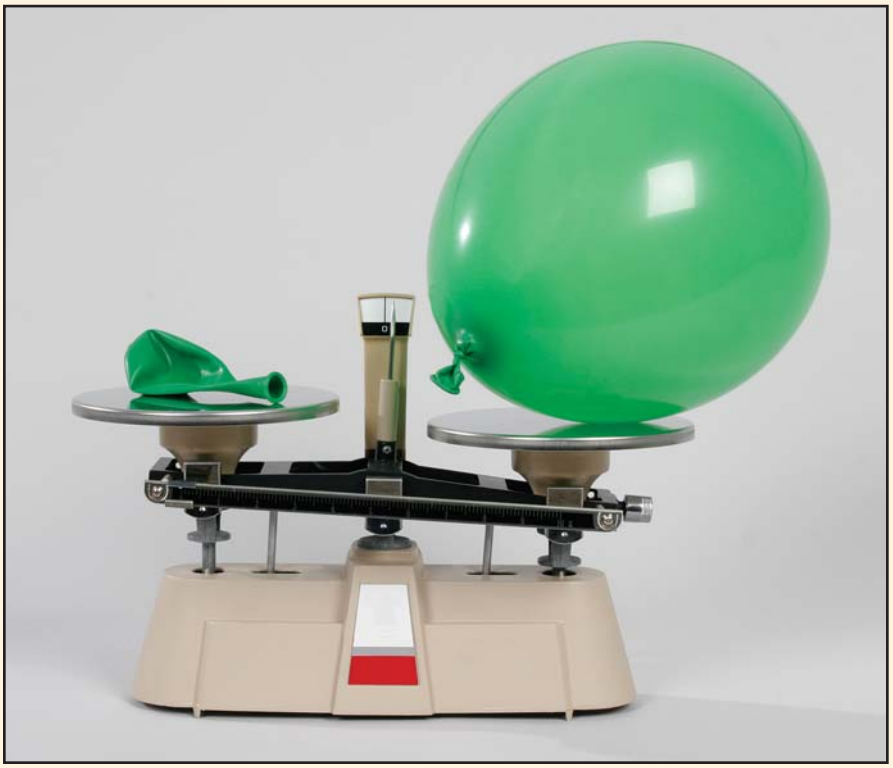
VOLUME

Volume is the amount of space that something takes up. There are several ways to measure the volume of an object. You can use a ruler and some simple math to calculate the volume of a solid like a wooden block. Measure the length, width, and height of the wooden block with a ruler. Multiply the three numbers together to calculate the block's volume.

A graduated cylinder is used to find the volume of a liquid.

To find the volume of a liquid, like milk, you can pour the liquid into a **graduated cylinder**. A graduated cylinder is a tool that is used to measure the volume of liquids. By reading the graduated cylinder, you can see the volume of the liquid you are measuring.

It is easy to see that a block of wood and milk have both volume and mass. Proving that air has volume and mass is more difficult. You cannot see air, so how can you tell that it takes up space? How can you tell that it has mass? Look at the picture with the balloons. An empty balloon is placed on one side of the balance. The other balloon is blown up and placed on the second side of the balance. The side of the balance with the inflated balloon goes down, showing that air has mass. The air is taking up space within the balloon, proving that air has volume.



Air has mass and volume.