

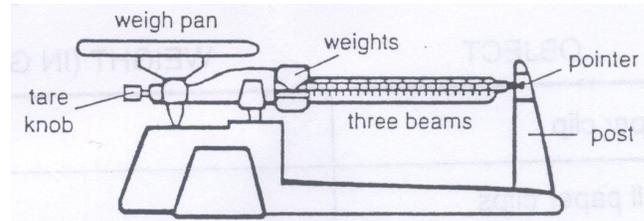
Metric Measurement – Mass

Mass is the amount of matter in an object. To measure mass, scientists use scales like a triple beam, balance, or electronic scales. **The standard of mass in the metric system is the gram.**

OBJECTIVE: In this activity, you will become familiar with the parts of a triple-beam balance that are used to measure mass, and you will practice measuring the mass of different objects. Then you will use an electronic balance to compare your answers, and you will learn how to “weigh-by-difference” to find the mass of different objects.

Watch video here:

<https://www.youtube.com/watch?v=zFKYDUWR5gM>



To Measure an Object's Mass

1. Make sure the “weigh pan” is clean.
2. Place an object on the weigh pan. The pointer line should move up. Your goal is to get the pointer line even with the 0 marked on the post.
3. To do this, manipulate the largest weight first, then medium, then smallest as you saw in the demonstration.
4. Add together all of the numbers that your weights are on. This is the mass of your object in grams.

Using an Electronic Scale

1. Lay the scale flat on the counter and press the On/Off button to turn on the scale.
2. The display will light up.
3. Once the value on the display changes to 0, locate the units listed across the bottom of the display. Ensure that “g” appears. This indicates that the unit in which the scale will measure is grams.
4. If it does not indicate grams, press the Units or Mode button until the display indicates grams.
5. Gently place the item you are measuring in the center of the scale. Wait a moment while it measures. View the measurement on the display.
6. Using the electronic scale, measure the same objects you measured with the triple beam.

Use the above steps to measure each object listed in the chart (in **grams**), and record its mass in the chart below for “Mass-triple beam balance” and “Mass-electronic scale.”

Object	Mass triple beam balance	Mass electronic scale
Paper clip		
One nickel		
One Quarter		
Pkg. of index cards		
Rock or bag of rocks		

***If the mass you have for the electronic scale is close to the mass you found with the triple beam balance, then you can feel confident in your skills at using the triple beam balance!**

To Measure an Object's Mass by Taking Difference

When doing this, we will be measuring the mass of an object, removing from or adding to the object, and then re-measuring the object to see how much mass was taken away or added.

1. **Adding Mass:** Measure the mass of the empty graduated cylinder. Write the mass in the column under "Mass Before." (This is the second column!) Add **exactly** 100 mL of water to the cylinder. Re-measure the mass and fill in the column under "Mass After Change." (This is the first column!) **Wait to calculate change.** Empty the water into the sink and set aside the cylinder. You are finished using it today.

2. **For objects that may not stay on the weigh pan:** Round objects are difficult to find the mass of when placed on a weigh pan because they tend to roll off. Take the cup and find the mass of the cup. Write that value in the column under "Mass Before." Place the ball in the cup as best you can and re-weigh the cup and ball. Write this value in the column "Mass After Change."

4. For every object subtract the "Mass Before" from the "Mass After Change" and write that mass under the "Mass Change" column. The "Mass Change" is the mass of the objects below. Fill in the objects' masses.

THIS COLUMN FIRST!

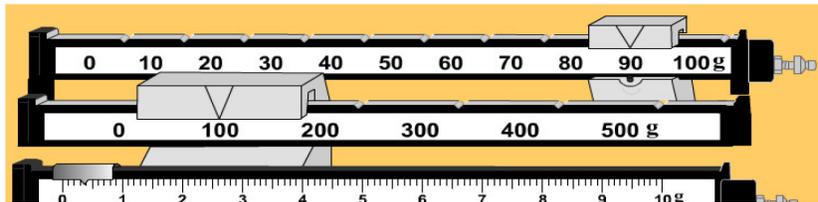
Object	Mass After Change	Mass Before	Mass Change (DONE AT END OF THE LAB)
1. Empty Graduated Cylinder	~140g	~40g	100g
2. Ball	Varies	Varies	Varies

Questions:

1. What is the mass of 100 mL of water? **100g**
2. What is the mass of the ball? **varies**

Record the mass show on each balance below. Remember to include both the value on the beams and the unit of measurement.

3. **190.4g**



4. **263.5g**

