

Biology 125- Human Physiology
Laboratory 1- Physiological Instrumentation

Brianna Kingsland

August 21, 2023

I. Purpose

The purpose of this lab is to understand the use of testing materials and develop familiarity with the physiologists “tools of the trade”.

II. Procedure

1. Learn/become familiar with the basic metric units of measurement.
2. Complete the worksheet using the information learned on metric units of measurement.
3. Start linear measurements of lecture text by measuring the length in cm and converting to mm by multiplying cm by 10.
4. Measure the width of the lecture text in cm and convert by multiplying cm by 10.
5. Measure the depth of the lecture text in cm and convert by multiplying cm by 10.
6. Complete linear measurements.
7. Start completing volume measurements by pouring water into a beaker.
8. Measure water volume in ml and convert to liter.
9. Take that same water and pour into a graduated cylinder for a more precise measurement.
10. Write down measurement in ml than convert to liters and document.
11. Take any object/weight and measure in grams, then convert to milligrams.
12. Take the beaker and place it on the scale, zero out the scale before pouring water into it.
13. Pour water into the beaker and take the mass of water.
14. Document in grams and convert to milligrams.

15. Next take the pH of container (A), container (B), and container (C).
16. Pour some of each container's solution into separate glass tubes.
17. After pouring solution into separate glass tubes, take the pH paper and place a piece into each glass tube.
18. Document each pH balance for each container.
19. Take your pulse/heart rate for 15 seconds.
20. Convert your heartrate into seconds and minutes, then document.
21. Take your pulse/heartrate for 60 seconds.
22. Convert your heartrate into minutes, seconds, and milliseconds, then document.
23. After each experiment/conversion is done, complete the take-home practice for metric measurements problems.

III. Result

Linear measurements

1. State the length of your lecture text: 280mm 28cm
2. State the width of your lecture text: 230mm 23cm
3. State the depth of your lecture text: 20mm 2cm

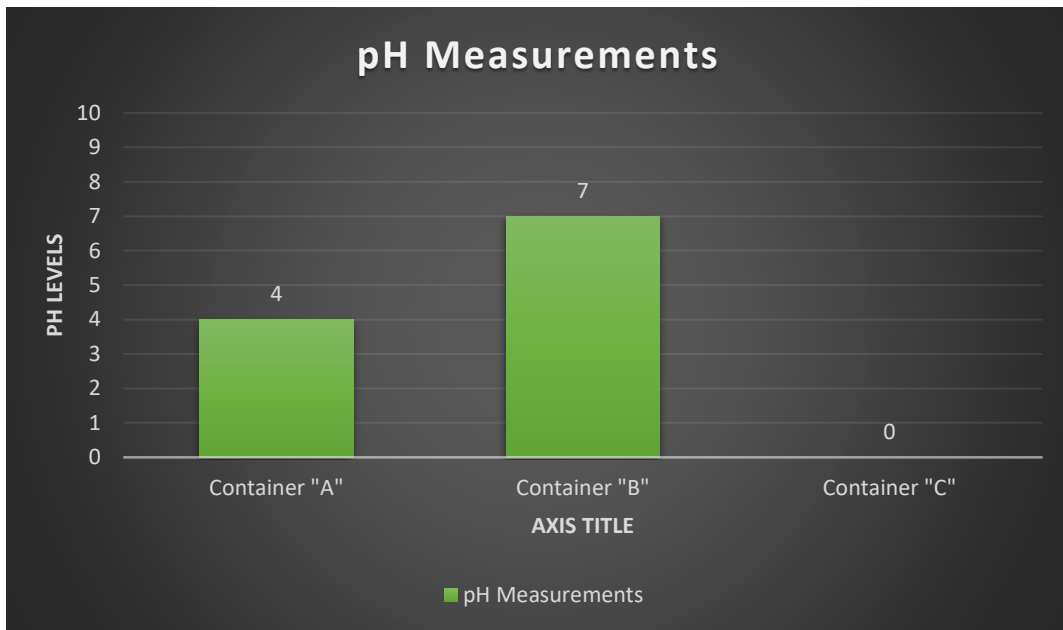
Volume Measurements

1. Pour some water in the beaker and state the volume: 75ml
0.075 liters (l)
2. Pour the water from the beaker into a graduated cylinder and state the volume: 71ml 0.071 liters

Mass Measurements

1. State the mass of the weight: 5,070mg 5.07g
2. Pour some water into the beaker and state the mass of the liquid in the beaker: 69,700mg 69.70g

pH Measurements



1. State the pH of the liquid in container "A": pH of 4 (acidic)
2. State the pH of the liquid in container "B": pH of 7 (neutral)
3. State the pH of the liquid in container "C": pH of 0 (alkaline)

Time Measurements

1. Determine your pulse rate after 15 seconds:
1.07 beats/second
64.2 beats/minute
2. Determine your pulse rate after 60 seconds:
63 beats/minute
1.05 beats/ second
1,050 beats/ millisecond

Take-Home Practice for Metric Measurements

1. A table measures 2.9 meters.
What does it measure in centimeters? 290cm
What does it measure in millimeters? 2,900mm

2. A cup on the table holds 800 ml of chocolate milkshake.
How much does it hold in liters? 0.8 liters
3. The milkshake weighs 463 milligrams.
What does it weigh in grams? 0.463g
4. A straw in the milkshake measures 26cm.
How long is it in meters? 0.26 meters
How long is it in millimeters? 260 millimeters
5. A pH meter inserted into the milkshake records a pH of 10.
 - a) Is this basic or acidic? pH of 10 is basic/alkaline.
 - b) What does basic refer to in terms of hydrogen ion concentration? It means that there is 0.0000000001 grams of H⁺ ion concentration per liter of solution.
 - c) What would be considered an acidic range for pH? Acidic range is pH 6 and below.
6. It takes a 16-year old 840,000 msec to completely consume the milkshake.
How long is this in seconds? 840 seconds
How long is this in minutes? 14 minutes

IV. Discussion

I realized today that using the metric system can really determine the precise measurements of many things. Its interesting that the United States does not use the metric system, but everywhere else does. Pretty strange if you ask me. I enjoyed learning the conversions and figure out the problems.

V. Conclusion

I learned today the measurements of the metric system and how to convert into smaller or larger measurements. Not only am I capable of using and converting with the metric system, but I was able to determine the pH balance of 3 solutions and complete time measurements of my heartrate.