Delanie Duran

Tuesday Labs 6:30-9:35

08/21/23

Laboratory 1 - Physiological Instrumentation

Purpose: The accurate measurement of physiological parameters requires the proper use of instrumentation. It is important to start getting familiar with the physiologist's "tools of the trade". This lab is to practice with measurements of chemical and physical parameters as well as the different units of measurements.

Procedures: For 1-A, observe the operation of these instruments and make an effort to recognize and identify each one. Understanding the applications of the "black box" which is used to take measurements of human physiological events such as heart rate. For 1-B, it is important to become familiar with the basic units of measurement as well as their prefixes of each unit.

Results:

Linear Measurements: **In millimeters** **In centimeters**

Length of lecture text	**27.9 mm**	**2.79 cm**
Width of lecture text	**21.7 mm**	**2.17 cm**
Depth of lecture text	**0.08 mm**	**0.008 cm**

Volume Measurements: **In milliliters** **In liters**

Volume of water in beaker	**100 mL**	**0.10 L**
Volume of water from the beaker into a graduated cylinder	**85 mL**	**0.085 L**

Mass Measurements: **In milligrams** **In grams**

Mass of the weight (beaker)	**113,140 mg**	**113.14 g**
Mass of liquid (water) in beaker	**82,860 mg**	**82.86 g**

pH Measurements:

pH of liquid in container “A”	**4.0**
pH of liquid in container “B”	**7.0**
pH of liquid in container “C”	**10.0**

Time Measurements:

Determine pulse rate after 15 seconds	**1.2 beats/second**	**72 beats/minute**

Determine pulse rate after 60 seconds	**1.2 beats/second**	**72 beats/minute**	**1200 beats/millisecond**

Discussion: For linear measurements the lecture text was the lab manual being recorded both in millimeters and centimeters. For volume measurements the beaker was filled with 100 milliliters or 0.10 liters, when poured into the graduated cylinder, the change of volume decreases down to 85 milliliters or 0.085 liters of water. This could definitely cause room for error when using a beaker since graduated cylinders are made for measuring volume of liquid and beakers are more for weighing mass. For pH measurements container “B” was at physiological pH of 7.0 while container “A” was more acidic at 4.0 and then container “C” was more basic at 10.0. For time measurements, using two fingers and counting pulses from the neck as well as experimenting with the “black box” which is a machine that is wrapped around the subject's finger and reads heart rate. Both have room for error as by doing it with the “black box”, it wasn’t completely accurate and did skip beats at times. By doing it manually it is possible to not count accurately. After doing both methods of taking heart rate, they were both very close in beats. Both methods read 72 beats per minute, which is 1.2 beats per second and 1,200 beats per millisecond.

Conclusion: This lab was to practice with different physiological measurements and basic unit measurements for upcoming labs in the future. There were measurements of linear, volume, mass, pH as well as physiological time measurements. The volume of measurement is something that could cause error in the future. Which is why it is important to start getting familiar with the physiologist’s “tools of the trade”. This lab is to practice with measurements of chemical and physical parameters as well as the different units of measurements.