

Laboratory 1 Report-Physiological Instrumentation

Purpose - It is very important to be able to accurately get a measurement of physiological parameters and be able to accurately use all of the different tools needed to get different measurements/results. The physiological instrumentation lab introduces all of the different tools and how to get measurement data from using those specific instruments. The lab also introduces units of measurement and how to convert the different measurements to other units.

Procedures - There were many different procedures in this lab. The first procedure was to observe the different instruments and to get to know each one. The second procedure was to become familiar with the different metric units of measurement and accurately use them. In the linear measurements part we had to measure the length, width and depth of an object in mm with a ruler and then proceed to convert those measurements into cm. In the volume measurement part we first poured water into a beaker and got the volume in ml and converted it into liters, we then poured that same amount of water from the beaker into a graduated cylinder and got the volume in ml and converted it into liters. In the mass measurement part we got mass of an object using a scale in grams and converted it into mg, we then had to find the mass of a liquid in a beaker by getting the mass of the beaker and the mass of both the liquid and the beaker in grams and subtracting them from each other to get the mass of the liquid only, we then converted the mass in grams to mg. In the pH measurement part we had to use a pH strip known as a litmus test to get the pH level of three different liquids, we then looked at the color on the strip and matched it to get each liquids pH balance and determine if the liquids were more acidic or basic. In the time measurement part we had to time how many times our heart beat in 15 seconds and from that figure out how many beats per minute, we then used the black box to determine our beats per minute and convert it to beats per second and beats per millisecond.

Results - Linear measurement data (Lab module booklet)

Length	Width	Depth
27.3 mm	21.5 mm	0.5 mm
2.73 cm	2.15 cm	0.05 cm

Volume measurement data

Beaker With Water (same)	Graduated Cylinder With Water (same)
100 ml	89 ml
0.1 l	0.089 l

Mass measurement data

Beaker	Beaker With Liquid	Liquid
117.95 g	208.00 g	90.05 g
117,950 mg	208,000 mg	90,050 mg

pH measurement data

Substance A	Substance B	Substance C
pH level 4	pH level 7	pH level 9
Acidic	Basic	Basic

Time measurement data

Pulse Rate (15 seconds)	Pulse Rate (60 seconds)
18 bps	19 bps
72 bpm	76 bpm
18,000 bpmilli	19,000 bpmilli

Discussion - The measurement review data had very clear results that made the importance of the equipment and units of measure be understood. In the linear measurement part we had used a ruler to measure the length (27.3mm,2.73cm), width (21.5mm,2.15cm), and depth (0.5mm,0.05cm) of the laboratory module booklet. I can see errors happening in this experiment due to not accurately measuring with a ruler and guessing the results. In the volume measurement section we had put 100ml (0.1l)

of water into a beaker and then put that same amount of liquid into a graduated cylinder and it came out to only 89ml (0.089l), the results of this are because a beaker is a lot wider and shorter than a graduated cylinder. The results of the experiment showed that the beaker is not a very accurate measuring device for liquids, a graduated cylinder is the better option because it is a lot thinner and has more marks. It also proved the point of having to use the right equipment so that errors do not occur in measuring. In the mass measurement part we had got the weight of a beaker with a scale which came out to 117.95g (117,950mg) and then added water to it which then weighed 208.00g (208,000mg). The results showed that the liquid inside of the beaker weighed 90.05g (90,050mg). Errors could occur in the experiment due to the scale not being accurate or zeroed out. In the pH measurement part of the experiment we were to find the pH of substance A (4), substance B (7), and substance C (9). The results of the experiment showed if the substances were acidic or basic, substance A was acidic and substances B and C were basic. Errors can occur in this experiment due to not having the correct pH strips or due to not looking at the pH color codes correctly. In the time measurement section we were to time our heart beat using the black box for 15 seconds (18 bps) and then for a minute (76 bpm) the results of this show how important the equipment is for measurements of human physiological events.

Conclusions - All of the measurement data collected in the lab had its own importance for allowing us to retrieve more knowledge about how to accurately collect the measurements of physiological parameters that need the proper use of certain instruments or devices. The data collected in the linear measurement section was pretty straight forward using the ruler to find the length, width, and depth of the lab booklet. The volume measurement section showed that even though there was the same amount of liquid in both the beaker and graduated cylinder the data showed otherwise. In the mass measurement section the data was easy to collect by having the scale

instrument which gave the exact number of grams the objects were. In the pH measurement section the data collected using the pH strip showed how each substance has its own pH levels which indicate if the substance is acidic or basic. In the last section which was time measurement our heart beat was timed using the black box and that gave exact data for our bpm which we then could find out how many times it beats per second and millisecond. In conclusion all of the data collected does show how important it is to be accurate with measurements and use the right equipment to figure out the end results.