Diana Valencia

Laboratory 1: Physiological Instrumentation

Purpose: The purpose of this lab is to introduce us to the concepts and equipments that we will be using throughout this course. It will also teach us how to properly use instrumentations so that we can accurately measure physiological parameters.

Procedures:

- Linear Measurements:
  1. Using a ruler we measured in centimeters the length, width, and depth of our lecture text.
  2. Using the conversion factor of 1cm=10mm we converted the measurement from centimeters to millimeters
- Volume Measurements:

  Pour some water in the beaker and record the amount in milliliters.
  Using the conversion factor of 1mL=.001L, we converted the volume from milliliters to liters.
  Pour the water from the beaker into a graduated cylinder and state the volume in milliliters.
  Using the conversion factor of 1mL=.001L, we converted the volume from milliliters to liters.
- Mass Measurements:
  1. Using a scale, we take the weight of a pencil, and record the weight given in grams.
  2. Take the weight in grams and covert it to milligrams by multiplying the conversion factor of 1g=1000mg, which will give you the milligrams.
  3. Place the beaker on the scale, then zero out the scale, so that it does not read the weight of the beaker.
  4. Pour some water into the beaker and state the mass of the liquid in the beaker. Measure the weight of the liquid in grams.
  5. Take the weight in grams and covert it to milligrams by multiplying the conversion factor of 1g=1000mg, which will give you the milligrams.
- pH Measurements:
  1. Grab 3 test tubes, test tube holder, and pH test strips.
  2. Label the 3 test tubes with A, B, and C.
  3. Pour 3 drops of the given liquids into the correct labeled test tube (i.e Liquid A into test tube A, liquid B into test tube B, etc..)
  4. Tear off 3 strips of pH testers, and insert them into each of the 3 test tubes, and allow it to soak until the strip changes color.
  5. Using the chart on the pH test strip, then compare the colors and determine the pH level for each individual test tube.
- Time Measurements:
  1. Set timer for 15 seconds.
  2. Place your finger on your neck or on your wrist, until you can feel your pulse.
  3. Start the timer & count your pulse for 15, then record that number.
  4. To determine your beats per second, take the amount of beats you previously recorded and divide it by 15.
  5. To determine the beats per minute, take the beats per second value and multiply it by 60 seconds.
  6. Now, set timer for 60 seconds.
  7. Place your finger on your neck or on your wrist, until you can feel your pulse.
  8. Start the timer, and count your pulse for 60 seconds., record that number.
  9. To determine beats per second, divide the number you previously recorded by 60.

10. To determine the beats per millisecond take the beats per second and divide it by 1000.

Results:

- Linear Measurements:
  1. State the length of your lecture text: 28 mm 2.8 cm
  2. State the width of your lecture text: 23.6 mm 2.36 cm
  3. State the depth of your lecture text: 1.5 mm 0.15 cm
- Volume Measurements:
  1. Pour some water in the beaker and state the volume: 50 ml 0.05 liters (L)
  2. Pour the water from the beaker into a graduated cylinder and state the volume: 46 mL 0.046 liters.
- Mass Measurements:
  1. State the ass of the weight: 5320 mg 5.32 g
  2. Pour some water into the beaker and state the mass of the liquid in the beaker: 44560mg 44.56g
- pH Measurements:
  1. State the pH of the liquid in container "A": 4
  2. State the pH of the liquid in container "B": 7
  3. State the pH of the liquid in container "C": 11
- Time Measurements:
  1. Determine your pulse rate after 15 seconds: 1.33 beats/second & 80 beats/minute
  2. Determine your pulse rate after 60 seconds: 78 beats/minute, 1.3 beats/second & 1300 beats/millisecond

Discussion:

- Linear Measurements: The main objective for this exercise was to learn how to accurately use a ruler, record, and convert the obtained measurement from millimeter to centimeters. A mistake that we could have done was not converting the measurements correctly. In this case there is 1 cm for every 10mm. Another error that we could've made was if we measured in inches instead of milliliters.
- Volume Measurements: While working on this experiment, we encountered some rough patches. A mistake that we made was that we pour too much water into the beaker, thinking that it would fit into the graduated cylinder as well, but it some water spilled. We started the process all over again, this time being more conscious of the amount of water we were going to use. On our second try we poured water into the beaker the measurement was about 50mL, but when we transferred it to the graduated cylinder, the measurement was 46mL.
- Mass Measurements: For this experiment, we had to simply place an object in order to get their weight. An error that could have been made was to properly zero out the scale, especially if we want to know the weight of a liquid.
- pH Measurements: During, this experiment we weren't told what liquids were in each bottle, but we where able to learn the pH level for each category. (Acidic, neutral, and alkaline.) A mistake that we were able to avoid was that we waited until that pH strip stopped changing color. Although, it can be a bit challenging deciding what color or level each liquid was, my partner and I were able to agree on what we felt was the correct pH level.
- Time Measurements: For this experiment, the goal was to determine our pulse rate at either 15 or 60 seconds, and learn how to convert the beats per second to beats per minute, and vice versa. I personally struggled with this experiment, because math is a bit challenging. But, thankfully my partner was able to help out and teach me how to properly do it.

Conclusion: In conclusion, we were able to understand the fundamental units of the metric system. We were also able to successfully learn how to convert units within the metric system. During, the pH level experiment we were able to recognize the relative acidity or alkalinity of each solution. Finally, we learned how to find our pulse rate and convert to either bpm or bps.