
	SKILLS CENTER MODULE MASTERY TASK ANSWER SHEET	A BIOFIZZ  PRODUCTON
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Date: 05/28/2024		Class: MCDB 1234/3456

NOTES:

- You must use this form to submit your MMT as a word doc.
- Paste images, screen shots etc, from your MMT into this document
- Include Module title from the website
- In the space below, please copy/paste EACH MMT question and complete each prompt in full sentences with clean and clearly labelled data.
- Do not attach any data or responses that are not directly relevant to answering each individual MMT
- Please make sure to follow the [rubric](#) guidelines. **Univeral module prompts** (those that are general to all modules) are indicated in bold font.
- Conclusions are required for EACH MMT. Please summarize the data used to draw conclusions. Discuss how the findings can be applied or relate to real-life scenarios. Clearly address the hypothesis, including discussing any sources of errors that might have influenced the results.

MMT QUESTIONS/ANSWERS

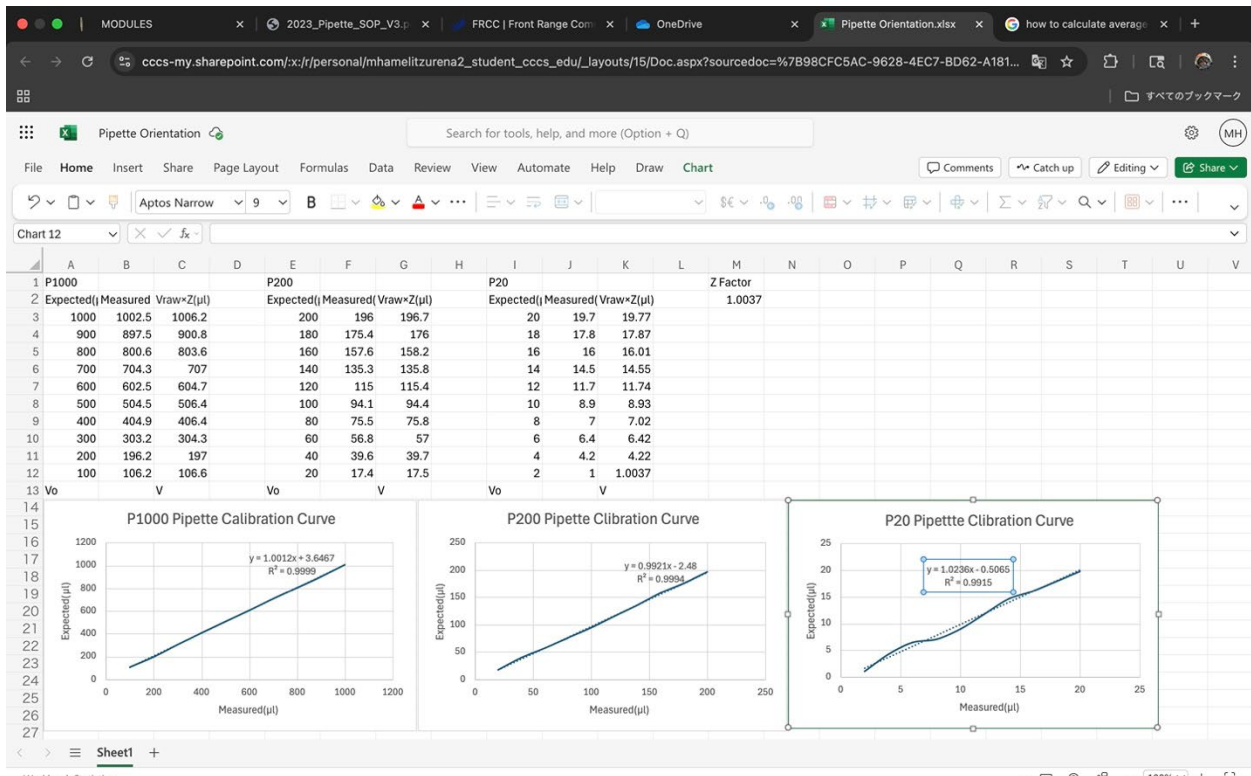
Planning/Organization)

1. Prepare a P1000, P200 and P20 to calibrate
2. Calibrate the pipettes
3. Measure the weight of the deionized water taken with a pipette on an electronic scale.
4. Calculate the accuracy and precision for each of the 3 pipettes

Materials and Methods)

Deionised water, Beaker, Pipette(P1000,P200,P20), Electronic scale

Data Analysis & Discussion)



$$V_{avg} = (1000 + 900 + 800 + 700 + 600 + 500 + 400 + 300 + 200) \div 10 = 550$$

$$V_{0avg} = (1006.2 + 900.8 + 803.6 + 707 + 604.7 + 506.4 + 406.4 + 304.3 + 197 + 106.6) \div 10 = 554.3$$

$$A = 100 - |100 - 100 \times (\frac{554.3}{550})| = 99.22\%$$

P200

$$V_{avg} = (200 + 180 + 160 + 140 + 120 + 100 + 80 + 60 + 40 + 20) \div 10 = 110$$

$$V_{0avg} = (196.7 + 176 + 158.2 + 135.8 + 115.4 + 94.4 + 75.8 + 57 + 39.7 + 17.5) \div 10 = 106.65$$

$$A = 100 - |100 - 100 \times (\frac{106.65}{110})| = 96.86\%$$

P20

$$V_{avg} = (20 + 18 + 16 + 14 + 12 + 10 + 8 + 6 + 4 + 2) \div 10 = 11$$

$$V_{0avg} = (19.77 + 17.87 + 16.01 + 14.55 + 11.74 + 8.93 + 7.02 + 6.42 + 4.22 + 1.0037) \div 10 = 10.75337$$

$$A = 100 - |100 - 100 \times (\frac{10.75337}{11})| = 97.76\%$$

This task will test your ability to make several standard solutions using a laboratory pipette.

1. Pick a P1000, P200 and P20 to calibrate
2. Calibrate the pipettes according to the calibration procedures
3. Create a curve on Excel for each one of the pipettes, using each of the 10 trials as your data points
4. Finally, calculate the accuracy for each of the 3 pipettes
5. Described how the A values and R2 values can be used to evaluate the accuracy of the pipette versus the precision of the pipette and pipette operator
If the R2 value is between 99 to 100, it would be considered as the precision of the pipette is acceptable. If the A value is between 99 to 100, it would be considered as the accuracy of the pipette is acceptable.
6. Make sure to provide conclusions and interpretations of the various calculations
7. Send your graphs, calculations, and conclusions to one of the proctors to check your results

Conclusions

To check the accuracy and the precision of each pipette, the A value and R2 value have to be between 99 to 100. In P1000 pipettes, the A value was 99.22% and the R2 value was 99.99%. That showed that both accuracy and precision fell in the 99-100% range. However, in both P200 and P20 pipettes, the precision was acceptable, but the accuracy was not because the R2 values were not between 99% to 100%. The A value of the p200 pipette was 96.86%, and the R2 value was 99.94%. The A value of the p20 pipette was 97.76%, and the R2 value was 99.15%. Especially in the P20 pipette, it was hard to measure the correct amount of DI water because a few air bubbles can affect the measurement directly. Therefore, the smaller the size of the pipette, the more difficult it is to measure accurately. I think it could happen because of an environmental issue or human error. To avoid those errors, it is important to use the pipette correctly.