Name _____ Date _____ Period _____

11

M&M Lab

Purpose – to apply all parts of experimentation, including the scientific method to find the answer to a question or series of questions.

Materials – cup of M&M's, paper towels, soap, digital scale, Clorox wipe, and calculator

Ask a Question – What color of M&M's is most common in the cup of M&M's?

A. **Hypothesis** – What color do you think is the most common? Explain what you think below. (Should be 1 to 2 sentences long)

Lab safety to consider – there is no eating M&M's at this point in the lab, all students must work in the assigned groups and not travel to other groups. Digital scales can break, goofing off is not allowed. Remember, if any individual chooses not to follow the lab guidelines or experiment procedures, the student will be removed from the lab or other consequences from the lab safety review.

Experiment Procedures #1

1. All students please wash hands at the lab station. There is soap to use and a roll of paper towels in the front of each lab station. Throw the used paper towel pieces into the trash bins located nearest the group.
2. Rip off a small amount of the paper towel to use and place on lab table.
3. Return the soap and paper towel roll to the front of the lab station.
4. Open the small cup of M&M's and empty onto the paper towel (it should be on the lab table).
5. While conducting this experiment, create a data table to neatly organize the data collected. A "t-chart" is an easy data table to create. Draw a large "**t**" that takes up most of the space in the box on the right.
6. Label the left side of the t-chart "M&M Colors".
7. Label the right side of the t-chart "Quantity".
8. Organize the M&M's into colors, and complete the t-chart with the results of the group's cup of M&M's for all of colors.

Analysis Questions

9. What is the independent variable in this experiment?

10. What is the dependent variable in this experiment?

11. What is the controlled variable in this experiment?

12. What is a qualitative observation for this experiment?

13. What is a quantitative observation for this experiment?

14. What is the conclusion for this experiment?

15. What CCC (cross-cutting concept) is used in this simple experiment?

Ask a Question - How does the color of M&M's affect the amount of mass found in an M&M's?

B. **Hypothesis** – Do you think the color of M&M's will have difference masses? Explain what you think below. (should be 1 to 2 sentences long)

Experiment Procedures #2

1. There is a digital scale in the front of the lab station, use 2 hands to move it from the front cabinet to the top of the lab table.
2. Go to the front of the lab to get a Clorox wipe from the teacher and use it to wipe the round, silver metal, pan on top of the digital scale.
3. Throw the used Clorox wipe into a trash bin nearest the lab station.
4. Create a data table to neatly organize the data collected. A t-chart will work.
5. Label the left side of the t-chart "M&M's Color".
6. Label the right side of the t-chart "Average Mass (grams)"
7. To get the best results, find the averages for the mass of each color.
8. Choose the first color of M&M's and place all of that color on the digital scale. If there are 13 blues, put all 13 on the silver pan to have the digital scale find the mass in grams.
9. Use the calculator and divide the total by the quantity of that color to find the average mass
10. For example, if there are 13 blue M&M's and the mass is 42 grams. Then in the calculator input **42 ÷ 13 =** to get the average and record in the t-chart.
11. Continue collecting data for all colors and to fill out the t-chart data table.

Analysis Questions

12. What is the independent variable in this experiment?

13. What is the dependent variable in this experiment?

14. What is the controlled variable in this experiment?

15. What is a qualitative observation for this experiment?

16. What is a quantitative observation for this experiment?

17. What is the conclusion for this experiment?

18. What CCC (cross-cutting concept) is used in this simple experiment?

Clean-Up – Once done, the group may share the M&M's (yes, it's true; permission is now given to eat the M&M's). Place the digital scale back into the correct shelf in the front of the lab table and throw the paper towel into the trash bin nearest the group. **Raise hands to be excused by the teacher**. Remember, students are not allowed to just leave, must be excused by the teacher.