**Mission Impossible?**

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Period: \_\_\_\_\_\_\_\_ Seat: \_\_\_\_\_\_\_\_

**Observation**: You are a spy. One of the BEST! But the bad guy just pulled one over on you and your team. You have all been poisoned.! The good news is there is a cure, but will you be able to figure out the antidote in time? Your strong science background has helped you out of tight spots before and you know it will again. Luckily, in typical bad guy fashion, he has revealed too much information because he thought he has won. He said something about osmosis not being your cells friend and something about explosions (ooh not good). You know osmosis is a type of diffusion, where water molecules will move from areas of high concentration to areas of low concentration. You also know that the concentration of other molecules can affect osmosis by directly affecting the concentration of water molecules. Based on this information, you think you know the poison you have been given. You also know that with this particular poison, you must find the right concentration (dose) you were given, to take exactly the right antidote…or your spy days are through.

**Question**: How does the concentration of the “poison” affect osmosis and which dose was I given?

Research…

**Hypothesis**: I think that the concentration of the poison will increase/decrease the rate of osmosis because \_\_\_\_\_\_\_\_\_\_\_\_

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**Experiment:**

**Materials**: 2 beakers scale 1 graduated cylinder 2 pieces of dialysis tubing

 water paper towels varying “poison” concentrations rubber bands (if needed)

 antidote collaboration poison (not really of course :)

**Procedure**:

1. Open your dialysis tubes by firmly rubbing the sides until it opens all the way down to the other end

2. Tie one end of each of your dialysis tubing (use a rubber band if you are having difficulties)

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3. Fill both of your 250 mL beakers with 150 mL of water

4. Now grab one of your dialysis tubes, add 3 mL of one poison concentration, leave a little bit of space then tie (or rubber band) the top

5. Next add 3 mL of the other poison concentration to the second tube, leave a little bit of space then tie (or rubber band) the top

6. Rinse off both tubes to remove any poison that may have spilled on the outside of the tube

7. Gently pat the tubes dry using one of your paper towels (leave the other paper towel for step 15)

8. Turn your scale on and set it to 0 by pressing the button that says “on/zero”

9. Place your first tube onto the scale and record the initial mass in the table on the back of this paper, remove tube

10. Place your second tube onto the scale and record the initial mass.

11. Next place one tube into one beaker

12. Place your second tube into your second beaker

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13. Gather data from your fellow spies (the other teams) for the other poison concentrations initial masses

14. Head back to your assigned seats and wait 30-40 minutes

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15. Take out each tube and gently pat it dry \*Make sure to get water out of the ends of the tubes

16. Place one tube on the scale and record its final mass, remove tube and throw away

17. Place the second tube on the scale and record its final mass, remove tube and throw away

18. Clean up by rinsing beakers well

19. Place all materials back where you got them at your station and turn off scales

20. Gather data from your fellow spies again and then head back to your seat

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21. See the board to calculate % change in mass

\*22. Based on your findings decide if the concentration of the poison speeds up or slows down osmosis \*\*\*The bigger the change in % mass, the faster osmosis occurred.

\*23. Use your data to decide approximately which concentration of Sucrose poison you were given.

\*24 Finally, decide if it the concentration of poison you were given was above 0.6 M Sucrose to decide on the correct antidote to take (Antilirilium if its above 0.6 M or Nithidotium if its below 0.6M)…then go get the antidote and take it!!!

**Data**

|  |  |  |  |
| --- | --- | --- | --- |
| **Dose Strength** | **Initial Mass** | **Final Mass** | **Percent Change in Mass** |
| Distilled Water |  |  |  |
| 1.0 M Sucrose (Strongest) |  |  |  |
| 0.8 M Sucrose |  |  |  |
| 0.6 M Sucrose |  |  |  |
| 0.4 M Sucrose |  |  |  |
| 0.2 M Sucrose (Weakest) |  |  |  |
| Unknown Sucrose Dose You Were Poisoned With |  |  |  |

**Analyze Data:** Manipulated variable: **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** Responding Variable: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_



Think Q’s: 1) Did the speed of osmosis increase or decrease as the strength of the poison dose went up? (Remember the bigger the % mass change, the faster osmosis happened)

2) How can you figure out the concentration of the unknown poison dose your team was given?

The unknown poison dose is… \_\_\_\_\_\_\_ M

**Conclusion**:

 My hypothesis was \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.