Homeostasis Lab

The project will address the following Learning Targets:

- Explain the role the cell membrane plays in maintaining homeostasis.
- Generate a hypothesis about how cells will react in low solute, high solute, and equal solute concentrations.
- Analyze and interpret data to explain the movement of molecules across a membrane.
- Collect data through measurements and develop models that explain the movement of water across a membrane.

You will be using chicken egg membranes to represent a cell membrane. You will place an egg with its shell removed in each of the following solutions--distilled water, a corn syrup water solution, and corn syrup--and measure the mass of each egg after 24 hours and 48 hours. You will then use the mass change to determine the tonicity of the solution towards the egg (hypertonic, hypotonic, or isotonic)

Your lab report will take the form of a **google slides presentation**. Include all of the following components in your report:

Slide 1 (or more if needed) -- Pre-Lab Summary:
Write a summary (5-7 sentences) explaining what you will do during the lab. **Your summary should answer the following questions in a *complete, coherent* paragraph.** This means that it SHOULD NOT be a bulleted or numbered list, nor should it simply be a list of answers in paragraph form. Make sure to answer the questions below; however, this does NOT mean that you should only include these questions. You can add other information as it feels relevant:

- What is the purpose of osmosis and homeostasis in cells?
- What is the function of the cell membrane and how does it aid in homeostasis?
- What are your solutions, why were each of these solutions selected?
- What will you look for to determine if your hypothesis is correct for each solution?

Slide 2 (or more if needed) -- Hypotheses:
Your hypotheses should be in "If_____, then _____" format. **You should have one hypothesis for each of your solutions.** Each hypothesis should be followed by an explanation of your reasoning.

Slide 3 (or more if needed) -- Procedure:
Copy the procedures below:

Three beakers, three eggs, corn syrup, and distilled water were obtained. The shells of the eggs were removed prior to the lab by soaking them in vinegar for 24 hours. After removing the shells, the beakers were labeled and 200mL of the following solutions were added to separate beakers: corn syrup, corn syrup solution (11%), and distilled water. The mass of each individual egg was recorded one at a time using an electronic balance and recorded. One egg each was placed in each of the solutions and allowed to soak. After soaking for 24 hours, each egg was again weighed and the mass recorded. The eggs were placed back into their respective solutions and allowed to soak for an additional 24 hours. The mass of the eggs was once again recorded after a total soak time of 48 hours. The eggs were placed back into the respective solutions and allowed to soak for an additional 24 hours. The final mass of the eggs was recorded after a total soak time of 72 hours. The data was then analyzed to determine how the tonicity of the solutions affected the movement of water into and out of the egg.

Slide 4 (or more if needed) -- Results:
Your results should include a data chart with the mass of your eggs at all 4 stages (initial, 24 hrs, 48 hrs, 72 hrs) and a graph of your eggs' mass over time. Please use the class data.

-**Data Chart:** make sure that it is organized, logical, and includes all of the data that you collected during the lab. Make it in Google Sheets!

-**Graph:** Be sure that your graph has a logical title, labeled axes, a key, and is neat and easy to read. Be sure that the graph displays the information properly. Your graph can be done in Google Sheets and copy and pasted to your presentation.

-You may include images of your eggs if you choose.

Slide 5 (or more if needed) -- Conclusion:
Write a conclusion (5-7 sentences) explaining what happened during the lab and WHY. Your conclusion should answer the following questions in at least one *complete, coherent* paragraph (however, you may include other information as you feel relevant). This means that it SHOULD NOT be a bulleted or numbered list, nor should it simply be a list of answers in paragraph form. ***In your explanations of what occurred, you should use your specific data.***

-How were the eggs affected by each of your solutions?
-Why did each of your eggs change the way they did?
-Were each of your hypotheses supported or refuted by your data?
-Give a real-world example of how solute concentration changes can affect an organism.

Slide 6 -- Conclusion Illustration:
Draw or digitally create a diagram of each of your set-ups. Include arrows to indicate the direction molecules moved. *Include in your drawing relevant solutes (in both the egg and the solution).* I suggest using the shapes in google slides to create your images.

Remember that this is graded as a SUMMATIVE!

Please see the rubric on the following page to preview how I will be grading your final lab.

Section	5	4	3	2	1
Experimental Execution 10 pts _____x2	Participated in experiment and followed all safety guidelines and provided evidence		Did not actively help with experiment, but had minor contributions and provided evidence		Did not help group with experiment
Pre-Lab Summary 20 pts _____x4	Correctly and completely answered all questions in correct format	Correctly and completely answered all questions in list format	Incompletely or incorrectly answered some questions	Only 1-2 of the questions were addressed.	No questions were fully addressed but there was an attempt.
Hypotheses 10 pts _____x2	All 3 hypotheses included in correct format with logical reasoning.	All 3 hypotheses included in correct format with vague or incomplete reasoning.	All 3 hypotheses included in incorrect format and/or without reasoning	2 of 3 hypotheses included	1 of 3 hypotheses included
Data Chart 5 pts _____	Data chart organized in a logical fashion and contained data		Data chart contained all data but was confusing to the reader		Data chart contained invalid data
Graph 15 points _____x3	Data was graphed appropriately and has all components (labels, title, key)		Data was graphed appropriately but is missing components		Data was graphed incorrectly
Conclusion-Summary 25 pts _____ x5	Correctly and completely answered all questions in correct format	Correctly and completely answered all questions in list format	Incompletely or incorrectly answered some questions	Only 1-2 of the questions was addressed.	No questions were fully addressed but there was an attempt.
Conclusion-Diagram 15 pts _____x3	Diagram of all 3 setups included and correctly labeled		Diagram of all 3 setups included but some labels are incorrect		Diagram included but unlabeled and/or missing parts

Total :_____