Eggsperiment Pre-Lab

(Do NOT lose this! Tape this in your journal when completed.)

**What amount of solute vs. water is required to mix up the following concentrations? Which units are needed? (Circle your answer)**

*Remember:* 1 g = 1 mL & your total solution should equal 100 mL

1. **20% sugar concentration:** \_\_\_\_\_\_\_\_\_\_\_\_ (g/mL) sugar & \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (g/mL) water
2. **7% salt concentration:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_ (g/mL) salt & \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (g/mL) water
3. **15% corn syrup concentration**: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (g/mL) corn syrup & \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (g/mL) water

4. The solute your group chose to work with is: sugar salt corn syrup

5. The concentrations you chose are: \_\_\_\_\_\_\_\_\_\_\_\_ %, \_\_\_\_\_\_\_\_\_\_\_%, & \_\_\_\_\_\_\_\_\_\_\_%

6. Your 1st beaker will contain: \_\_\_\_\_\_\_\_\_\_\_ (g/mL) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ & \_\_\_\_\_\_\_\_\_\_\_mL H20

7. Your 2nd beaker will contain: \_\_\_\_\_\_\_\_\_\_\_ (g/mL) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ & \_\_\_\_\_\_\_\_\_\_\_mL H20

8. Your 3rd beaker will contain: \_\_\_\_\_\_\_\_\_\_\_ (g/mL) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ & \_\_\_\_\_\_\_\_\_\_\_mL H20

**BEFORE placing your eggs in concentration, you will measure (each / one) of your eggs for the initial measurements. These measurements will include:**

9. Quantitative observations (can be measured with standard scales- *use numbers*): \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

10. Qualitative observations (cannot be measured with a scale, but touch, sight, etc.- *use descriptions*): \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

11. Define “testable question” \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

12. Come up with a testable question for **your** experiment today regarding the solute and concentration choices you made: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

13. Define “hypothesis” \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

14. Come up with a hypothesis for your experiment that answers your testable question:

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Eggsperiment Protocol

(Remember to be **specific**, use **numerical information** and **proper units**)

List the materials (units included!) required to carry out your experiment, and how many of each you will need:

1. 6. 11.

2. 7. 12.

3. 8. 13.

4. 9. 14.

5. 10. 15.

Describe the process of turning store-bought eggs into shell-less membrane-bound eggs:

(hints: vinegar; shell; calcium; dissolve; soak 3 days; wash hands (why?))

1.

2.

3.

Describe the protocol you and your group came up with, making sure to be **specific**! (If you were to receive a protocol from another group and had no idea what the experiment was about, what would you want it to say? How detailed would you want it to be? Make your protocol like this- CLEAR!)

1.

2.

3.

4.

5.

6.

7.

8.

9.

10.

Eggsperiment Data & Observations

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Beaker (250ml) # | Solution  (% solute) | Initial Weight of Egg (grams)  & girth (cm) | Weight of Egg after 24 hours (grams) & girth (cm) | Initial Observations  (qualitative)  & **prediction** | Final  Observations  (qualitative)  & **outcome** |
| Control | 5%  Acetic acid  (Vinegar) | \_\_\_\_\_\_\_\_\_\_\_\_ g    \_\_\_\_\_\_\_\_\_\_\_\_cm | \_\_\_\_\_\_\_\_\_\_\_\_ g    \_\_\_\_\_\_\_\_\_\_\_\_cm | Observations:  Prediction: | Observations:  Outcome: |
| #1 | \_\_\_\_\_\_\_\_\_\_\_%  \_\_\_\_\_\_\_\_\_\_\_\_\_ | \_\_\_\_\_\_\_\_\_\_\_\_ g    \_\_\_\_\_\_\_\_\_\_\_\_cm | \_\_\_\_\_\_\_\_\_\_\_\_ g    \_\_\_\_\_\_\_\_\_\_\_\_cm | Observations:  Prediction: | Observations:  Outcome: |
| #2 | \_\_\_\_\_\_\_\_\_\_\_%  \_\_\_\_\_\_\_\_\_\_\_\_\_ | \_\_\_\_\_\_\_\_\_\_\_\_ g    \_\_\_\_\_\_\_\_\_\_\_\_cm | \_\_\_\_\_\_\_\_\_\_\_\_ g    \_\_\_\_\_\_\_\_\_\_\_\_cm | Observations:  Prediction: | Observations:  Outcome: |
| #3 | \_\_\_\_\_\_\_\_\_\_\_%  \_\_\_\_\_\_\_\_\_\_\_\_\_ | \_\_\_\_\_\_\_\_\_\_\_\_ g    \_\_\_\_\_\_\_\_\_\_\_\_cm | \_\_\_\_\_\_\_\_\_\_\_\_ g    \_\_\_\_\_\_\_\_\_\_\_\_cm | Observations:  Prediction: | Observations:  Outcome: |

Eggsperiment Analysis Questions

1. **Define** a “control.” What is the purpose of a control? What was the control in your experiment and how does it inform your specific experiment?

2. **Interpret** your data. Were your predictions accurate? How were your predictions similar or different from the outcomes in each situation?

3. **Analyze** your qualitative results. What does the before-and-after information tell you about how the egg reacted in each solution?

4. **Analyze** your quantitative results. What does the before-and-after information tell you about how the egg reacted in each solution?

5. **Discuss** the internal vs. external environment of the egg. How do they interact? What component of the egg allows for this interaction? How is this concept related to cells and the relationship between their internal and external environments?