# **Bubble Membrane Lab**

# Set Up

1. Create the bubble solution by mixing the water, soap, and corn syrup in the 1000ml beaker.

Materials

## 1000ml beaker

* **900ml water**
* **100ml dish soap**
* **25ml corn syrup or glycerol**
* **4 bendable straws**
* **30 inches of string (optional)**
* **Spool of thread**
* **1 clean straw**
* **Shallow tray (cafeteria trays work well)**

1. Create a bubble frame by using the following instructions.

**Method One**

* 1. Bend 4 straws at elbows.
  2. Flatten the shorter ends of straws and fold flatted surface in the middle (**See Fig. 2**).
  3. Connect straws together by inserting short ends into long ends to create a square (**See Fig. 3**).

**Method Two**

1. Cut straws in 5 ½ inch lengths.
2. Run a 30 inch string through all four straws.
3. Tightly tie ends of string together to create a frame.
4. Cut off loose ends of string.
5. Create a ring of thread by tying a loop about two fingers wide.
6. Cut off the loose ends.
7. Place bubble frame into shallow tray
8. Add bubble solution to slightly cover bubble frame.



# Procedure

# Task 1: Membrane Flexibility and Fluidity

# Lift the bubble frame out of the solution so that a thin film spans the frame.

# Tilt the frame back and forth and observe the surface of the film.

# Notice the swirl of color as the light reflects off the film. Molecules in the cell membrane move about in a similar fashion.

# Hold the frame by the edges and rotate the sides in opposite directions. Notice the elasticity of the film. (See figure below)

# Hold the bubble film parallel to the floor and gently move the frame up and down until the surface begins to bounce up and down.



# Task 2: Membranes Can Self- Repair

# Figure out how to pass a finger or hand through the membrane without popping it.

# When you figure it out, write down the solution below:

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# Task 3: Eukaryotic Cells Have Membrane-Bound Organelles

# Using a clean straw, place the tip into the bubble solution in the tray.

# Figure out how to create bubbles within a bubble. These represent organelles like the nucleus, lysosomes, and ribosomes inside the cell.

# How many can you get?? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

# Task 4: Membrane Proteins Perform Special Functions

# Using a piece of thread, tie into a circle.

# Using this thread, figure out how to get a DRY finger through the bubble membrane. (dry and soapy does not count!)

# How did you do it? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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