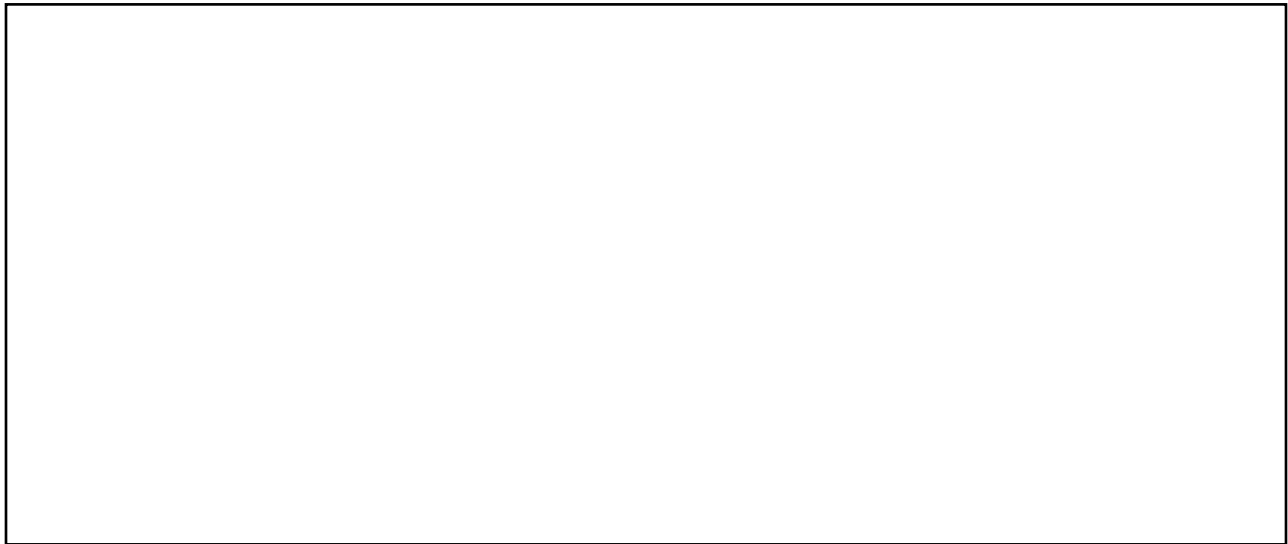


## Designing Polymers to Clean Water Worksheet

### Before Building your Design

**Directions:** Answer the following questions below.

1. What is a foulant?
  
2. Why is it important to prevent foulants from the surface of water filtration membranes? (Identify the Problem)
  
3. Draw your design in the box below. Label the hydrophilic polymers, the **water filtration membrane**, the **foulants** and the **water**. (Brainstorming and Planning)



4. Predict how your design will work to block foulants from the surface of the water filtration membrane.

### Building your Design

**You will share your design with the rest of your teammates, and you will choose the best (or a combination of the best parts) of design to build.**

5. How well did your design work? What might you need to improve? (Testing)

Name: \_\_\_\_\_ Date: \_\_\_\_\_ Class: \_\_\_\_\_

6. What are some potential limitations of the model in comparison to real life? (Reevaluate the design)

**Extension Questions:**

7. What is the % efficiency water flow of your design? Calculate by using the following equation:

$$\% \text{ Efficiency of water flow} = \frac{\# \text{ water molecules pass through to membrane surface}}{\# \text{ of total water molecules}} \times 100$$

Our **water flow efficiency %** is \_\_\_\_\_ %.

8. What is the % **foulant blockage** of your design? Calculate by using the following equation:

$$\% \text{ Foulant Blockage} = \frac{\text{Total \# foulant particles} - \# \text{ foulants that pass to membrane surface}}{\# \text{ of total foulant particles}} \times 100$$

Our **foulant blockage %** is \_\_\_\_\_ %.

9. Based on your calculations and test results, draw a new and improved design in the box below. Label the **hydrophilic polymers**, the **water filtration membrane**, the **foulants**, and the **water**.