WORKSHEET 1: Marine Debris Toxicity Predictions & Methods

*Question:* Is marine debris leachate toxic to barnacle larvae (or brine shrimp)?

*Treatments:* cigarette filter leachate, cigarette tobacco leachate

*Marine debris type:* ________________

*Hypothesis:* If ______________ is toxic then ______________

*Serial Dilution Experiment:*  
Serial Dilution is a stepwise dilution of a substance in solution. Using the leachate, we will make a serial dilution, and then test toxicity (of varying strengths of the leachate) on barnacle larvae. Toxicity will be calculated by measuring the % mortality (total dead/total alive*100) of barnacle larvae.

*Methods: Calculate your serial dilution:*

<table>
<thead>
<tr>
<th>Concentration level:</th>
<th>Full Strength</th>
<th>¾ Strength</th>
<th>½ strength</th>
<th>¼ strength</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amount of water to add from marine debris water to test tube</td>
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<tr>
<td>Amount of plain sea water to add to test tube</td>
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<tr>
<td>TOTAL amount of liquid in test tube</td>
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</table>

Which dilution do you predict will have the highest mortality?
Which dilution do you predict will have the lowest mortality rate?
Why?
Graphically draw your predictions for your experiment:

What will be on the Y-axis? Units?
What will be on the X-axis? Units?

Do you think there will be a difference among the treatments (plastic water bottle leachate, cigarette tobacco leachate, and cigarette filter leachate)? Why or Why not?