

>> Diane Jewell: Prepare 0.95 molar lithium bromide from 2.5 liters of 1.5 molar lithium bromide. Okay, this is a dilution. You're starting with a stock solution that is already made. It's at 1.5 molar. Now, when you dilute a solution, you make it less concentrated, and so you're going from 1.5 to .95 molar. Okay. The information we have here now is that this is what we're starting with. We have 2.5 liters of a solution that's already made, so this is our first volume, and this is our first molarity, or our first concentration. We're making a second solution. That second solution will have this concentration. So this is actually molarity number two, the concentration number two. And the question we have now is, what is the second volume? Okay? So we're going to use this equation here. The concentration of the first solution times volume of the first solution equals concentration of the second solution times volume of the second solution. Now, since we're looking for V2 to solve, we want to isolate the V2, right here, by moving M2 over to the other side of the equation. You can see it's in multiplication, so we're going to divide both sides by the M2. We end up with this rearranged equation: V2 equals M1, V1 divided by the M2. Now, we've already identified what each one of these variables is. M1, we said, was the 1.5 molar; V1, 2.5 liters; divided by your M2, which is the .95. You can see those molarities are going to cancel out, leaving us with liters, and when we do this 1.5 times the 2.5 divided by .95, we get 3.9 liters of our second solution. So that would be now V2. Okay? This doesn't answer our question, though. If we want to prepare it, how do we prepare it? We don't – we know that eventually when it's prepared, we're going to have 3.9 liters made, but how do we make that 3.9 liters? Well, the 3.9 liters is our second solution. We make that by taking our first solution and adding water to it to make the second solution. And so if we want to know how much water we have to add, we need to, at this point, isolate added water. So added water is going to be solution two, which is your 3.9, minus solution one, which is your 2.5. So 3.9 liters minus the 2.5 liters gives us 1.4 liters. This is the amount of water added to the 2.5 liters to give us 3.9 liters of final material. So we're adding 1.4 liters of water to our first solution.