>> You can express concentration of a solution in units of percent. There's three of them. There's mass percent, volume percent, and mass over volume percent. We're going to be looking at all three of those. Mass percent is percent M over M. Okay, in this case we're using grams for our units. So to solve a problem, and figure out what is the percent, mass percent of a solution you would take the grams of your solute, and then you would divide it by the grams of a solution. Now, to get the grams of solution you would add together the grams of solute, and the grams of solvent. Okay. So once these are added together these become the denominator. This divided by this, and then times the 100 to give you your percent. Okay. So that gives you your mass. Now, if you will look, mass percent. Now, if you're looking at volume percent, that's going to be percent V over V as your units. You can either do it in liters or milliliters, but whatever you use is for units for your solute, you have to use the same for your units for your solvent. So if your solute is in liters, your solvent is going to be in liters, and if one is in milliliters you're going to do both of them in milliliters. So to figure out the volume percent you're going to take your liters of solute, and then you're going to divide it by the liters of the solute added to the liters of the solvent. That gives you your liters of solution. Once you've gotten your answer for this, then you multiply the whole thing again by 100 to give yourself the percent. Okay. You may see mass over volume percent. That is percent M over V. The M will stand for grams. That's going to be your solute. The V stands for volume. This time it's in milliliters, not in liters. So your solution is going to be in milliliters. And when you go ahead and solve that, you're going to take your grams of solute divided by the milliliters of solution, and then multiply the whole thing times 100. So this is how you would calculate the percent for each one of those types of units, mass volume and mass over volume. Now, if we look at it, we've got two different things here. We've got grams over grams. Liters over liters, and grams over milliliters. What does this tell us? Well, this tells us remember anything that has two different units can be used as a conversion factor. And so, here you'll see we have conversion factors. Conversion factor for mass percent would be grams of solute divided by 100 grams of solution. Okay. For volume percent, for percent volume would be liters of solitude over 100 liters of solution. And then percent mass over volume would be grams of solute over 100 milliliters of solution. Okay. You might ask yourself where is the difference between what we have here, and what we have here, and it's really where are we get to put that 100. In each one of these to solve the percent they all have to be multiplied by a 100, but to change it to a percent from a percent to a conversion factor we have to put the hundred into the denominator for each one of these conversion factors.