>> How much heat is lost wave number 5 grams of steam condenses at 100 degrees C? Okay, again, we have our 25 grams of steam. And we have the process of condensation at 100 degrees C. So what we want to do is think about that's happening during condensation. During condensation you have water molecules in the form of a gas, those gas molecules have no attractions to each other. They're just kind of doing their own thing out in space. But when we cause them to condense, they are now form a liquid. Liquids have intermolecular attractions to each other that cause them to form a body that has a cohesiveness, it sticks together. Such as in a drop of water. Okay, so what we're looking at now is 25 grams of steam coming together, it's forming these interactions and forming liquid water. When it comes together, when the grams of steam come together, we have what's called the heat of vaporization. Heat of vaporization is the amount of energy that must be lost in order for the molecules to actually form the interactions with each other to form water. Heat of vaporization of water is 540 calories per gram of water. Okay? So using this equation now, heat removed equals grams times Delta H vaporization. We have 25 grams of steam, our Delta H of vaporization is 540 calories per gram of water, or steam. Our grams will cancel out, we multiply 25 times 540, we get 13,500 calories. Okay. At this point now we want to go back and make sure that our significant figures are correct. We have 25 is our initial number. It has two significant figures. Now we have three significant figures in our answer. The 1, the 3, and the 5. We want to then stop the significant figures at two places, 13,5 rounds to 14,000. So now our answer is 14,000 calories. Now this is what is released or removed when steam becomes water. But what happens water becomes steam? Well, we're talking about the same process but in reverse. We are talking about again, vaporization. Now water has those intermolecular attractions. They have to be broken. It's going to require 540 calories to break every intermolecular attraction in a gram of ice. Or in, I'm sorry, in a gram of water, in order to make steam. And so if we're starting with water going to steam, then we're going to again use 540 calories per gram water. We're using the same equation and we're going to set it up and get the same answer. But now in this case, if this is water going to steam instead of removing the heat, we are adding the heat with a Bunsen burner or with a hot plate.