>> Here you see the heating curve for water. Okay a heating curve has two axis. The x axis is your heat added and your y axis over here is your temperature in degrees c. Now with a heating curve you're starting down here at the left with a solid. The solid with the ice. Solid, we think sometimes of solid as just sitting there it doesn't move or anything, but actually a solid has different molecules that are bound together very tightly so that they can't move away from each other. And yet the solid molecules themselves actually have a lot of movement. They waggle back and worth, they vibrate this. There's a lot of movement. Now if you start with a solid that's below zero, solid water and you start adding heat which is in this direction as you add heat to the solid, the solid will start warming up. And what's happening as its warming up is the wagging and the vibrating is increasing. Now once it gets to zero degrees c this is called the melting point. Okay. And at the melting point we know that ice will melt to water. Now look at what happens here. This is something we don't expect. We assume at that once you add something, you add heat to water or add heat to ice it will continue getting warm. But in actual it's at the melting point it stops heating up. As you're putting heat into the system now, the solid is turning to a liquid. What's happening at that point, well remember the solid is kind of bound together with very strong intermolecular attraction so that the molecules can't move. That's what gives it the features of being a solid. Once it becomes a liquid now, these attractions have to break apart so that now the molecules can move around and slip and slide around each other. Okay. And so, at this point all that heat that's being added is actually translating into a motion now that's allowing the solid molecule that's break apart and form a liquid. And so instead of increasing in temperature you're going to see that change from solid to liquid with the breaking apart. This like I said is the melting point and this is what we were talking about at this point is where we use the delta h of fusion, the heat of fusion here. Okay. What we're seeing here at this plateau as it starts, the first molecule that is a solid is becoming a liquid. As more and more liquid forms, we go across here, at this point here where the plateau ends and it starts going up again our very last solid molecule has become a liquid. Now all we have at this point is liquid water. As we continue to add heat, we're going to see the water getting hotter and hotter. At first the water is 0-degrees and it continues to gain heat going up into the curve until it gets to 100-degrees C. At 100-degrees now this is our boiling point. What happens at boiling? Well that's where your liquid molecules will turn into gas molecules. Remember we said liquid molecules have that intermolecular attraction that lets them slip slide around but they still keep in contract with other. Once they get to 100-degrees C one by one those molecules are going to start escaping. It's kind of like they achieves escape velocity and they go off by themselves as a gas. Okay. And so, as you start to see this plateau again the last, the first water molecule has just turned into a gas molecule and left the body of water. And this now you'll see that the temperature will remain constant at 100-degrees as vapor is leaving the water. When we get to this point the last bit of water liquid will turn into a gas. Now at this point all the water is in gas form as steam. Okay. So, as we continue to add heat now the gas temperature will start rising again. So, at

this point when it rising we just have solid. At the plateau a phase change or a state change we have both solid and liquid going up again we just have liquid, plateau again we have a liquid and a gas at the boiling point. Okay. Now we see it going up again. That's because all we have again is gas.