>> Ok, now we want to balance this equation. This one is a little different from the last one because this one has sulfate in it, and sulfate is a polyatomic ion. If you see something like this, what you want to do is you want to look at the second side of the equation and see if the sulfate is in the same form. SO4, SO4. We can see that the sulfate did not break apart, but it stayed as an intact ion going from one place to another. And so what we can do when we balance this now, instead of calling this one sulphur and four oxygens, we can just call this one sulfate and not have to worry about breaking it into pieces. So let's go ahead and take inventory. We have aluminum. There's one. Hydrogen is two, and our sulfate is one because there's only one sulfate here. And then on this side – – we have two aluminums. Hydrogen came next, so let's go ahead and do that. We had two hydrogens. And now look what happens with sulfate. Here's sulfate. It's within parentheses, and on the outside of the parentheses is a subscript three. That means we have three sulfate polyatomic ions. So let's go ahead and put SO4, three. We've got three of them. Ok? So you can see we have our job ahead of us of balancing. Now in this situation, the best planning is to balance, find something that you're going to balance last. When you have something like this where hydrogen is all by itself, or even this one here, aluminum is all by itself, those are the best ones to balance last. When you balance something like this, sulfate is part of a compound here, and sulfate is part of a compound here. If I were to balance that one last, once I balanced this, I'm going to throw this off. Or if I balance it over here, I'm going to throw this off. So I don't want to save that for last because then I have to go back and do it all over again because I've just messed things up. So I'm going to go ahead and start with sulfate. Let's go ahead and start by balancing the sulfate. We have four, I'm sorry, we have three over here, and we have one over here. So let's go ahead and balance on this side. We have to multiply this one times three in order to have the same number of sulfates on both sides. Again, we're taking just the number we're multiplying by. It's going to be the three. We're going to put that in front of this whole compound as our coefficient. Ok? Don't put it down below. It's not going to be a subscript. It becomes a coefficient. Ok? So we have three H2SO4 now. Ok? So the sulfate is balanced. Now we can balance either aluminum or hydrogen, either one, because both of them, like I said, both of them happen to be alone, so either one would be a good one to end with. So let's go ahead, since aluminum is listed first, let's just do that one. We have aluminum one and aluminum, we have two. We have to balance this side by multiplying by two. So one times two gives us two. Now we both have the same number of aluminum on both sides. We multiplied by two, so this two will go here. So now we have two aluminums. Ok? Everything is balanced now. Oh, and look what happened. The hydrogen happened to be balanced all by itself. We don't have to change that. So theoretically we've got a balanced equation. But let's make sure that we really are balanced and we haven't made a mistake. We have two aluminums. Two aluminums. That's good. Hydrogens, three times two is six hydrogens. Oh, we forgot to do something here. When we changed this, we also changed that, didn't we? This is why it's always good to check as that got past me. Ok, so we have to go back and change this. This

is no longer two. This is six. Ok? So hydrogen is not balanced. We have to balance it. We have six here. We have two here. We need to multiply this one by three to have six on this side. What are we going to use? The three or the six? We're going to use that times three. The three is what's going to go up here, not the six. The three. Ok, now let's go back to checking it again. Two aluminums and two aluminums. Three times two is six hydrogens. Three times two is six hydrogens. Three sulfates, three sulfates. So you can see the equation is nice and balanced and we're finished.