>> Anytime we have a rule, we always have a situation that breaks the rule. Now, we've talked about octets and about how substances like to form octets, that gives them the aid electrons in their valent shell, and that seems to make them very stable. Well, I need to show you a couple of examples of substances that don't form octets, and yet they're still very stable. This is beryllium, beryllium is in group 2a, it has two valence electrons. So, here's our two valence electrons. When beryllium combines with chlorine, we get two chlorines for 7 times 2, is 14 electrons, we end up with 16 electrons altogether. Now if you look there, he's your octet around your chlorine, and here's your octet around your other chlorine, but look what happened to beryllium. Beryllium has four electrons. We thing, gee, it must not be very stable, it's not an octet. But beryllium acts differently than the other elements in its group, and it just is very stable with four electrons in its valence shell. Boron behaves in the same way; boron has three electrons in it valence shell. Now, one thing boron and beryllium have in common is that if you look at the periodic table, they're at the very top of their groups. And because they're at the top of their groups, they tend to behave a little differently from the rest of their group. And the reason being is that those electrons are so close to the nucleus that in some situations, and you might notice it here, remember beryllium and boron are both left of that staircase, meaning they're both metals, and yet look what's happening, we have a metal and nonmetals, and this is a covalent compound. Metal and nonmetals; covalent compound. And they don't have octets. So, it's something to do with the fact that those electrons are so close to the nucleus and held so tightly, sometimes the nucleus just will not allow these elements to release those electrons to become ions, and so they do sometimes form covalent compounds, sometimes they do form ionic too, so it's not totally covalent. But like I said, they are exceptions. So, beryllium forms what we call an incomplete octet. The octet idea is so important, that we can't come up with a title without putting the word octet into it. Everything's an octet, but our exception is an incomplete octet. Okay, so that octet rule is still very important, here's a rule breaker. Here's our second rule breaker: boron has the three electrons in its valence shell, it's in group 3a. When it binds to fluorine, it forms BF3, okay, which you'll see here. Altogether there's 24 electrons, here's the first eight, giving fluorine an octet, here's the second eight giving this fluorine an octet, and the same with this one over here. What does that leave for boron? Six electrons. Is it stable? Yes, it's very stable. And so these are our two examples of incomplete octets; rule breakers.