

>> Diane Jewell: We want to look at subatomic particles in isotopes. So what we're going to look at here is magnesium. We've already talked about magnesium. We said there's magnesium 24, magnesium 25, and magnesium 26. Let's find out exactly what each one of those isotopes contain. What you see next to each one is called the nuclear symbol, also referred to as the atomic symbol. You have magnesium. Up above, you have and in front of, to the left of, you have the mass number and here you have the atomic number. Magnesium 25, mass number of 25, atomic number of 12. Again, magnesium mass number of 26 and atomic number of 12. So if you're asked to write the nuclear symbol for something, this is what you're being asked for. If you're asked to write the atomic symbol for something, same thing. Okay? They're just 2 different designations but they mean the same thing. Okay, now let's look at each one. Magnesium 24 12, that 12 is the atomic number. Atomic number tells us the number of protons. It also tells us the number of electrons; 24 now tells us the number of combined protons and neutrons. So if we take 24 and subtract the number of protons, it just leaves us with the number of neutrons remaining. So the number of neutrons will be 24 minus the 12 is 12. So what does this one have? Magnesium 24 has 12 protons, 12 electrons, 12 neutrons. Now magnesium 25, do it the same way. Atomic number 12, so there's 12 protons, 12 electrons. The mass number though is 25. So the number of neutrons now is 25 minus 12, which gives you 13. What do we have then in magnesium 25? We have 12 protons, 12 electrons, 13 neutrons. Okay? Magnesium 26, here's your 26. Again, magnesium has atomic number of 12, 12 protons, 12 electrons, and 26 minus 12 is 14 neutrons. So what is it that makes each one of these different? Is it the atomic number is different? No. Atomic numbers are all the same. How about the number of protons? No. Numbers of protons are all 12. Number of electrons are all 12. What's changed is that the mass number and since the protons are consistent, that means in each case the number of neutrons is different. So we have 12 neutrons, 13 neutrons, 14 neutrons. So if you're ever asked what's the difference between the isotopes, the isotopes are different from each other because they differ in the number of neutrons.