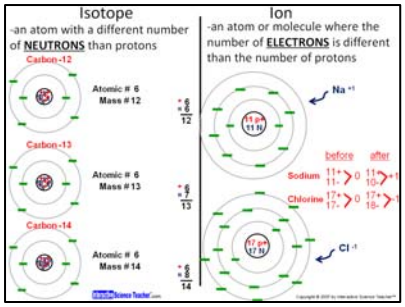
Isotopes And Ions

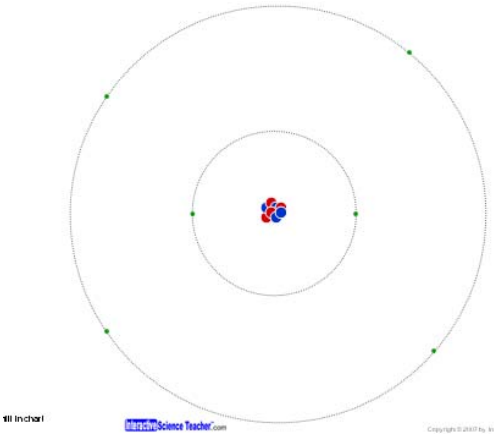


Confused about isotopes and ions? Let this lesson help straighten you out. 3 carbon isotopes are presented.

Then on the other side of the paper we'll watch chlorine steal an outer electron from sodium and create an ion.

1. Start the day with a little review. Go over the atom- protons and neutrons in the nucleus, with electrons zipping around it.

This entire lesson is available as a PowerPoint- see last page.



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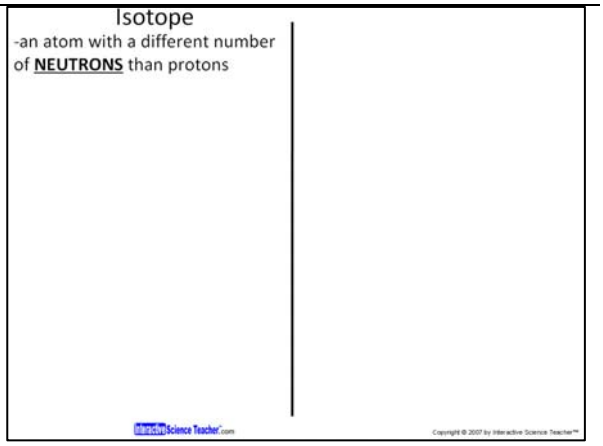
2. If you're using the Student Handout (see last page), have students copy the definition as shown. Otherwise, on a blank sheet of paper have them do so.

If you're using the PowerPoint, let students know their job is to copy everything they see on the screen.



Isotope

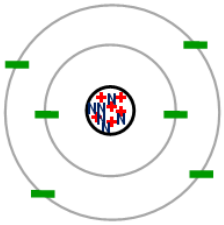
-an atom with a different number of **NEUTRONS** than protons

3. Below the Isotope definition, draw what will be the nucleus for our first isotope- carbon-12. Draw 6 little +'s and 6 little N's together.

Isotope

-an atom with a different number of **NEUTRONS** than protons

4. Add the electrons. We'll use the Bohr model today to keep things a little more clear. If you've already covered the model of the atom, remind students that this has changed into the electron cloud model.

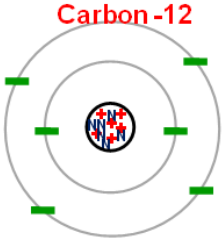


Isotope

-an atom with a different number of **NEUTRONS** than protons

5. With the atom now complete, we'll count the number of protons (that's our atomic number), number of neutrons (add to protons for mass number). The mass number 12 gets added to the end of the name "Carbon".

Carbon -12

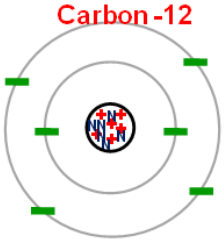


Atomic # 6
Mass # 12

+ 6
N 6
12

6. Let's make another atom that almost the same, except it has one more neutron in the nucleus. When you add up the particles in the nucleus, your new mass number is 13.

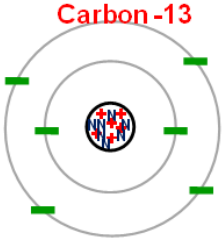
Carbon -12



Atomic # 6
Mass # 12

+ 6
N 6
12

Carbon -13



Atomic # 6
Mass # 13

+ 6
N 7
13

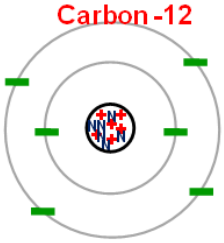
Isotope

-an atom with a different number of **NEUTRONS** than protons

7. The last one (Carbon-14) has another extra neutron (8 total). That makes the mass number 14.

That's isotopes in a nutshell.

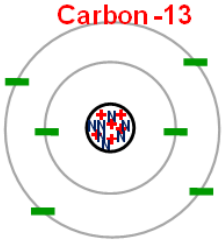
Carbon -12



Atomic # 6
Mass # 12

+ 6
N 6
12

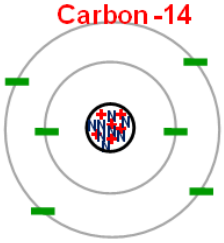
Carbon -13



Atomic # 6
Mass # 13

+ 6
N 7
13

Carbon -14



Atomic # 6
Mass # 14

+ 6
N 8
14

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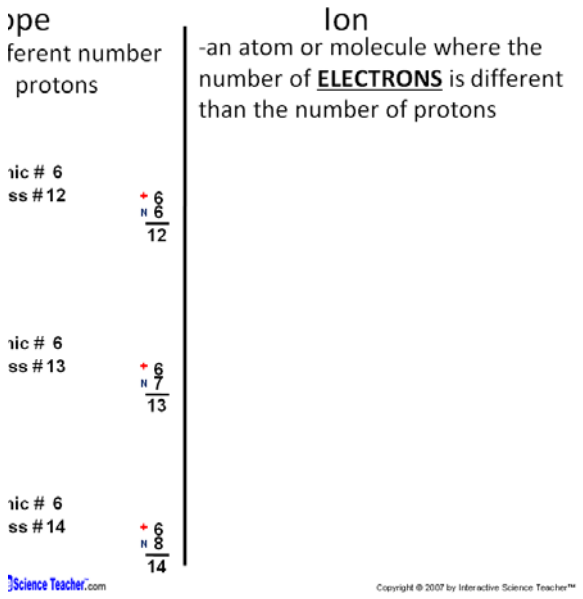
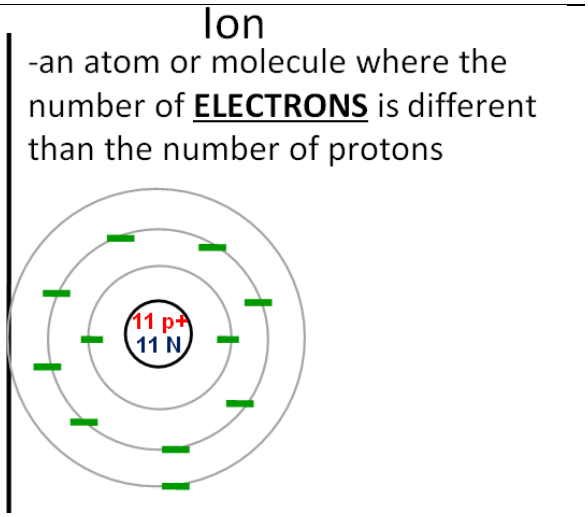
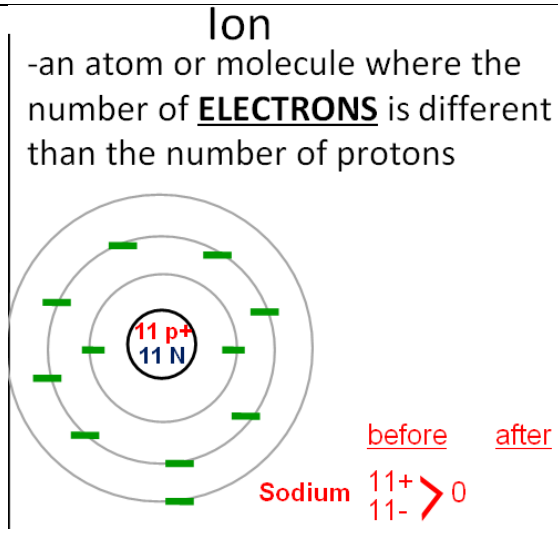
8. Now onto ions, which we'll do on the other side of the paper. Start with a simple definition.



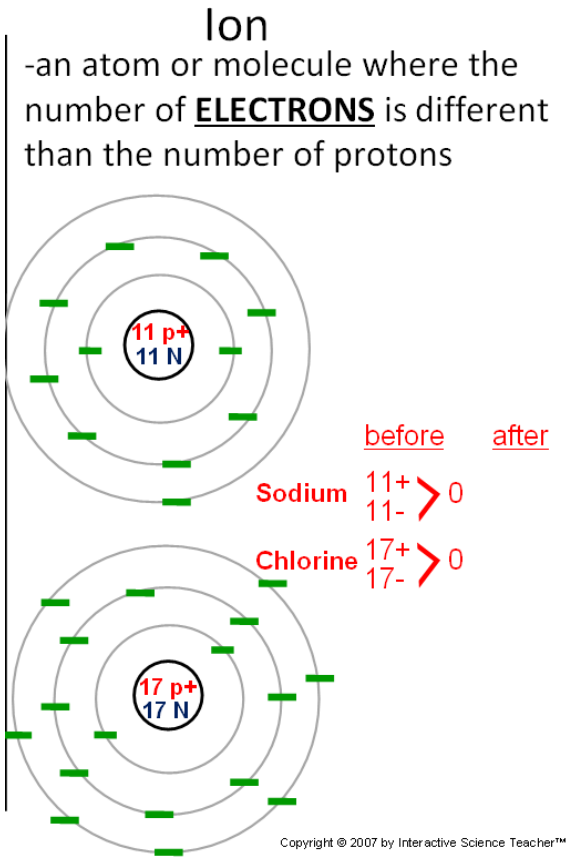
9. Draw an atom of sodium as shown. We won't draw every proton and neutron here because they aren't the point.



10. Take a "before" inventory. Right now we have 11 protons and 11 electrons. The sum of those charges is zero.

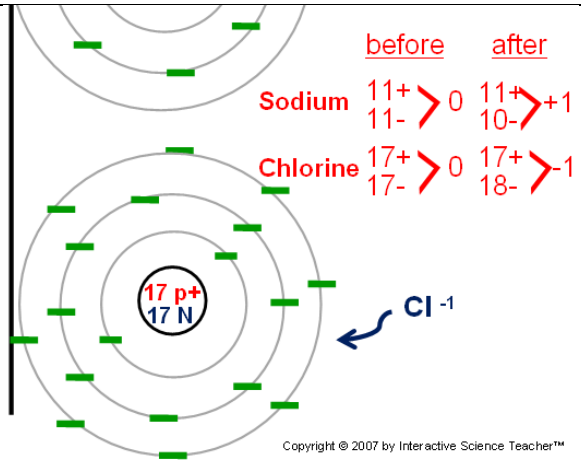


11. Below sodium draw an atom of chlorine. Take its inventory (17+ and 17- = 0).



12. Notice that one lonely outer electron that sodium has, and the one electron that chlorine *could* use, and then move it.

13. Do an "after" inventory with the new electron arrangement. Sodium will now be an overall +1 because it lost a negatively charged electron, and chlorine will be -1 because it gained the electron.



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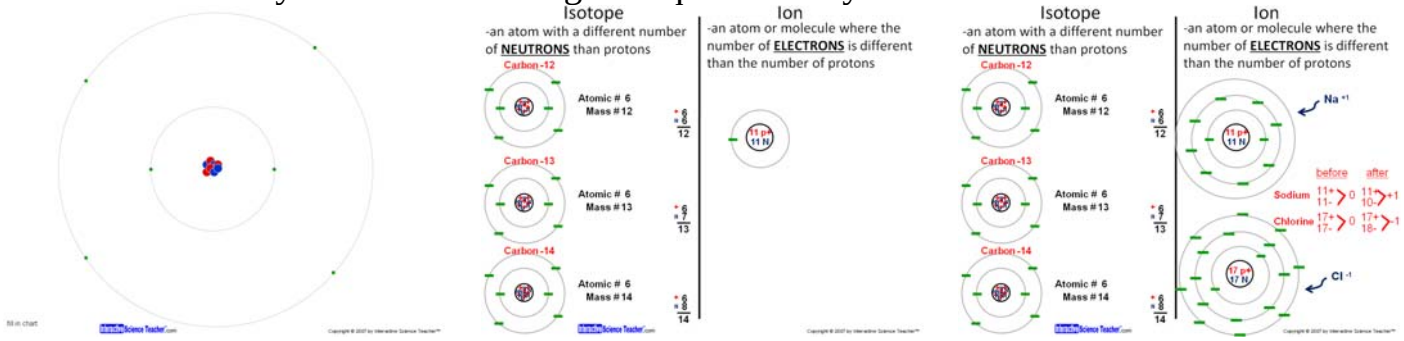
PowerPoint- lead your students through the quiz click-by-click



Student Handout- do the lesson quicker and easier