
# Atoms, Molecules, and Ions

Beginning Chemistry/First Year Chemistry Students

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| **Overview** | **The students will learn about the different terminology when dealing with atoms, molecules, and ions and will be able to use these terms when in the chemistry classroom throughout the year.** |
| **Objectives** | Following this lesson students will be able to identify the following terms:<br>• Atomic number<br>• Massnumber<br>• Nuclide symbol<br>• Isotopes<br>• Atomic weight<br>• Different areas on the periodic table |
| **Materials** | • Chemistry Notes<br>• Pens/pencils<br>• Computers<br>• Chalkboard/dry erase board<br>• Demonstrations of chemical reactions<br>• Ping and Twitter account for each student |
| **Additional information** | • Each student will need to get a ping.fm account and a twitter account for the in class quizzes.<br>• Students should log in to ping.fm to answer the questions as the lesson goes.<br>• Why use ping.fm? By using ping.fm the students can electronically submit their answers to the questions without having to be on Facebook or Twitter where they would be distracted by looking at profiles.<br>• What are the benefits for the teacher? The teacher can easily access all the answers from each student by logging into their Twitter account. On the right side of the teacher's Twitter login page there is a tool that says @teachersname and the teacher can click on this and all the tweets the teacher is tagged in will show up. One more benefit for using ping.fm connected to Twitter is instant feedback for the teacher to see if the students are understanding the concepts or not.<br>• How does this exactly work? Each student will tag the teacher by putting @teachersname. For my students they will put @emdinoto.<br>• How is this useful? In twitter you are only allowed to use 140 characters so all answers will be concise and to the point. On ping.fm there is a character |

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| | counter so that helps the students know how many letters and spaces they have left.<br>• It is helpful that before a teacher attempts this lesson that they have a practice session with all their students so the students understand how this works as well as the teacher.<br>• One more important piece of information is to make sure that the students have their ping.fm account set only so Twitter gets updates or specify that these updates go only to Twitter or they will be updating their Facebook or myspace accounts with chemistry answers. |
| **Procedure** | 1. Begin talking about foreign languages and how important it is for everyone in the culture to understand what is going on, so to have a productive society.<br>• Explain that chemistry is the same way. All scientists have to know exactly what the other one is talking about.<br>• Talk about the periodic table and say that in every country it is exactly the same so no matter where you are you can talk about a specific atom or equation.<br>• Now talk about how within the chemistry world there are many other terms that are important for scientists to know.<br>2. Periodic Table ( use a periodic table on the board, overhead, etc and label)<br>• Show these following areas<br>♦ Periods<br>♦ Groups<br>♦ Stair step<br>♦ Metals<br>♦ Nonmetals<br>♦ Metalloids<br>♦ Transition metals<br>♦ Inner transition metals<br>❖ Ping question 1. What period and group is P (Phosphorous) in? A. Group 15. Period 3.<br>3. Atomic number (show on periodic table)<br>• This is the number found on the periodic table that goes in sequential order.<br>• This is the number of protons an atom has.<br>• This number does not change for a specific atom<br>• If this number does change we have a different atom<br>❖ Ping question 2. What is the atomic number of K (Potassium) A. 19<br>4. Mass number<br>• This number cannot be found on the periodic table.<br>• Mass number is a whole number found by adding the number of Protons and the number of neutrons together.<br>• What is the number on the periodic table? This number is the average atomic mass, this is an average of all the isotopes of the atom.<br>♦ Avg=(mass of isotope)(fractional abundance)+…… |

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| | 5. Isotopes<br>• Not all atoms of specific element have the same atomic mass.<br>• Atoms of a specific element will always have the same number of protons but the number of neutrons can change, which will affect the mass number.<br>• For example, Carbon has three naturally occurring isotopes. Carbon-12, Carbon-13, and Carbon 13. This means they all have 6 protons and 6, 7, and 8 neutrons respectively.<br>6. Nuclide symbol<br>• The top number is the mass number and the lowe number is the atomic number<br>❖ Ping Question 3. What is the mass number and what is the atomic number of $^{209}_{82}$Pb? A. 209 and 82 respectively. |
| **Evaluation** | The students will have questions from the book to complete for homework and then an exam that covers this and other subjects. |