Name:

Period:

Making Sense of Electron Configurations and Orbitals

**Introduction**: While the densest part of the atom is the nucleus, consisting of positively charged protons and neutrally charged neutrons, most of the atom is composed of empty space. This empty space is taken up by electrons, which are arranged in predictable places around the nucleus, known as **orbitals**, or **shells**. This activity allows you to better understand how these orbitals are arranged, and also help in identifying elements that may be unknown using the given information.

**Directions**: Read each question carefully, and decide from the information given what element is present, and how the element’s electrons are configured. We are assuming all of the elements given (unless otherwise stated) are neutrally charged – there are the same amount of electrons and protons.

**Remember**: The electron shells are arranged as follows: 2, 8, 8, 18,32 18. Start with the smallest shell and make your way up.

***Example Question***: *I am a mystery element. I have two electrons in my inner shell, and three electrons in my second shell. What element am I? What is my atomic number? Correct configuration?*

1. I am helium-4. How many neutrons do I have? How many electrons total? How many do I have in my outermost electron shell? Configuration?
2. I am oxygen-18. How many neutrons do I have? What is my atomic number? How many electrons total? How many in my outermost electron shell? Configuration?
3. My element symbol is Ne and I have a mass of 23. Which element am I, and how many neutrons do I have? How many electrons do I have? Electron configuration? Is my outermost shell full? If not, how many more are needed?
4. My element symbol is Si and I have a mass of 30. How many neutrons do I have and what is my correct shorthand notation? How many electrons do I have? Electron configuration? Is my outermost shell full? If not, how many more are needed?
5. My atomic number is 12 I have a mass of 23. What isotope am I? How many electrons do I have in my outermost electron shell? Configuration?
6. My atomic number is 17 and a mass of 35. What isotope am I? What element am I? How many electrons do I have in my outermost electron shell? Configuration?
7. I have three electron shells. In my outermost shell I have four electrons. What element am I? Configuration?
8. I have two electron shells. In my outermost shell I have five electrons. What element am I? Configuration?
9. I am aluminum. I have a +3 charge. How many protons do I have? How many electrons do I have? Configuration (with charge)?
10. I am fluorine. I have a -1 charge. How many protons do I have? How many electrons do I have? Configuration (with charge)?
11. My element symbol is P, and I have a -3 Charge. What element am I? How many protons do I have? Electrons? Configuration (with charge)?
12. My element symbol is Be, and I have a +2 charge. What element am I? How many protons do I have? Electrons? Configuration (with charge)?