WKS – Chem 1
Electrons: Waves & Orbitals

Name: _____
Period _____ Date _____

1) Circle the two statements below that correctly describe aspects of Bohr's Model of the atom.
   (A) Electron paths are controlled by probability.
   (B) Electrons travel in circular paths called orbits.
   (C) Electrons can have any energy.
   (D) Electron energies are quantized.

2) Which of the two statements that you circled (in previous question) is now known to be false? _____
   Rewrite that statement so that it is true.

3) Why is the wavelength of a moving soccer ball not detectable to the naked eye?

4) Use de Broglie's wave-particle duality and the Heisenberg uncertainty principle to explain why the location of an electron in an atom is uncertain.

5) What is an orbital?

6) Explain how the concept of an electron orbital satisfies Heisenberg's uncertainty principle.

7) Compare and contrast the Bohr model and quantum mechanical model of the atom.

8) How many different types of orbitals (sublevels) are there in any energy level? What are the first six different sublevels, in order, and how many orbitals are there in each? What pattern is there?

[over]

9) Fill in the following table showing details of the atomic orbitals through energy level 6.

Principle Quantum Number (n)	Row	Orbital Types (Sublevels)	# of Orbitals	# e^-	Total Orbitals (n^2)	Total # e^-
1	1	**1s**	**1**	**2**	**1**	**2**
2	2					
3	3					
4	4					
5	5	* add: _____	 add:			
6	6	* add: _____	 add:			

*For n=5 and n=6, list the orbitals that already existed in the previous energy levels, then indicate the one added orbital for this energy level.