Unit 3: “Bohr-ing Notes”

**Objective:** Students will be able to draw Bohr diagrams to show approximate locations of all electrons in an electrically neutral atom.

**Essential Questions:**

**1.** If protons are attracted to electrons, why don’t the electrons crash into the nucleus?

**2.** Draw the bohr diagram for a Ca (calcium) atom.

**3.** What does a bohr model (diagram) show for an atom?

**Thinking Side: Main Notes Side:**

Where are the electrons

of an atom located?

(think-pair-share)

**Bohr-ing History** \_\_\_\_\_\_\_\_\_\_\_\_ attraction is the attraction of negative charges to positive ones. Therefore the negative \_\_\_\_\_\_\_\_ in an atom are attracted to the positive \_\_\_\_\_\_\_\_ in the \_\_\_\_\_\_\_\_. In the early 1900’s scientists were looking for an explanation to a curious problem with their model of the atom.

Why don’t atoms collapse? The negative electrons should collapse into the nucleus due to the attraction

between \_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_. Scientists were at a loss to explain this until

\_\_\_\_\_\_\_\_\_\_\_ proposed his “\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_” model of the atom.

A ball on a string model:

A ball on the end of a string will never collide with your hand when you swing it in circles,

even though you are constantly pulling on the string.

Why won’t it hit you? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Using this logic, why is it

possible for electrons not

to crash into the nucleus?

**Energy Levels:**  After Bohr proposed the Solar System Model (that electrons orbit a nucleus just like planets orbit the sun), he called the orbits \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**Bohr Model of an Atom:**

**Please draw: Key:**

Higher energy levels are \_\_\_\_\_\_\_\_ away from the nucleus. For an electron to go in to a higher energy level, it must \_\_\_\_\_ energy. Sometimes, the electrons can absorb \_\_\_\_\_\_ enegy.

|  |  |
| --- | --- |
| In diagram | Subatomic particle |
| + |  |
| - |  |
| o |  |

Does an e- need to absorb \_\_\_\_\_\_\_\_ Please explain why or why not using evidence.

or gain energy to go from

the 2nd to 1st energy level?

|  |  |
| --- | --- |
| Energy Level | Names of Sub-levels that exist in that level |
| 1st |  |
| 2nd |  |
| 3rd |  |
| 4th |  |

**Energy Sub-Levels:**

Note:

**Orbitals:** exist inside \_\_\_\_\_\_\_\_\_\_. Different sublevels have different numbers of \_\_\_.

An analogy to describe the difference between an orbital and a sublevel is:

Only 2 \_\_\_\_\_\_\_\_\_\_ can fit in each orbital.

s-orbital: \_\_\_ electrons

d-orbital: \_\_\_\_ electrons

|  |  |
| --- | --- |
| Sub-level | # of Orbitals possible |
|  |  |
|  |  |
|  |  |
|  |  |

Since a d \_\_\_\_\_\_\_\_\_\_\_ has 5 orbitals (and each orbital can contain up to \_\_\_\_ electrons) then a d sublevel can contain \_\_ electrons (= 5 x 2). Pay attention to the

difference between \_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_.

How many electrons 1st energy level: \_\_\_\_\_\_\_\_\_

can fit into each of the 2nd energy level: \_\_\_\_\_\_\_\_\_

energy levels? 3rd energy level: \_\_\_\_\_\_\_\_\_

4th energy level: \_\_\_\_\_\_\_\_\_

To the right, please draw:

Draw the bohr model

for Hydrogen atom:

Draw the bohr model

for Helium atom:

Draw the bohr model

for Sodium ion:

**Summary** (answers to essential questions here….COMPLETE SENTENCES FOR 1 and 3) Highlight info in notes that you used to write summary, please ☺)