**Atoms, Elements, and Compounds**



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**Unit Description**

Before we study chemical reactions, we need to understand how chemicals are formed and how to communicate these chemicals using scientific terminology. We start by looking at the building blocks of chemicals: atoms. Using the periodic table, we'll examine the properties and classify elements formed from one type of atom. The next step is to combine different kinds of atoms to form compounds, which we'll learn how to write their chemical formulae and their names. Although we won't study specific types of chemical reactions, we'll need to differentiate between physical and chemical changes of elements and compounds.

**Learning objectives**

1. Understand and identify the differences between physical and chemical changes
2. Categorize natural and artificial processes as physical and chemical changes (ex. state changes)
3. Provide examples of chemical and physical changes
4. Recognize and correct mistakes in chemical formulas of ionic compounds
5. Construct ionic compounds from at least 2 different elements and write their chemical formulae
6. Understand that elements are made of the same atom, while compounds are made of at least 2 different atoms
7. Describe the discoveries that shaped the model of the atom
8. Use the periodic table to describe and calculate the make-up of atoms and ions, including the number of protons, neutrons, and electrons
9. Draw Bohr models of the first 20 elements in their neutral and ionic form
10. Explain the formation of ions using the stable configuration of noble gasses
11. Describe the properties of matter such as its mass, volume, density, color, state, and conductivity
12. Differentiate between elements and compounds
13. Describe how particle motion changes between the three states using Kinetic Molecular Theory

**Assessment**

1. Homework/Hand-ins (class handouts, reflections, assignments, and presentations - no marks, feedback only) - 40%
2. Quizzes - 20%
3. Unit Test - 40%

**Useful Links**

InstaSnow:

http://www.stevespanglerscience.com/lab/experiments/insta-snow-polymer

School of Dragons: Alchemy Adventure

Apple: https://itunes.apple.com/us/app/school-dragons-alchemy-adventure/id885038943?ls=1&mt=8

Android: https://play.google.com/store/apps/details?id=com.KnowledgeAdventure.ElementsMatch&hl=en

PHeT simulations: Build an Atom

http://phet.colorado.edu/en/simulation/build-an-atom

History of Atomic Chemistry:

https://www.youtube.com/watch?v=thnDxFdkzZs

Khan Academy

https://www.khanacademy.org/science/chemistry