Lesson Title	Ionic Bonds and Chemical Formulas
Length of Lesson	One (50 minute) class period
Created By	Bo Cherry
Subject	General Science
Grade Level	7th grade
State Standards	7th: 1 h (Inquiry); 2 a (Physical Science)
DOK Level	DOK 2
DOK Application	Predict, Infer, Categorize
National Standards	5-8: A (Inquiry); B (Physical Science)
Graduate Research Element	Water quality is often determined by analysis of the cations and anions present in the water sample. An understanding of where these occur and sources for their presence is key in understanding hydrologic systems.

Student Learning Goal:
MS 7th Grade:
(Inquiry) 1 (h) Make relationships between evidence and explanations. (Physical Science) 2 (a) Identify patterns (e.g. atomic mass, increasing atomic numbers) and common characteristics (metals, nonmetals, gasses) of elements found on the periodic table of elements.

National Science Education Standards of Content 5-8:
(Inquiry - A) Communicate scientific procedures and explanations; (Physical Science - B) Properties and changes of properties in matter.

Materials Needed (supplies, hand-outs, resources)
Computer, Projecter, Table Salt (small container), beaker, copper rods, wiring, light bulb, battery (small 12V), water, lab analysis (INSPIRE_analysis _Cherry _09.15.11)

Lesson Performance Task/Assessment:
The instructor will begin this lesson by discussing ions and how they form. A brief discussion on types of ions and their charges will follow. Next, the instructor will discuss ionic bonding. Examples will be given and the mechanisms for the formation of ionic bonds will be displayed for several examples. At this point, students should know how to construct a lewis dot structure, and should know what this structure means. The instructor can then use the dot structures to better explain ionic bonds. The instructor will then discuss the names of chemical formulas. The instructor should begin by showing an example and explaining what the subscripts represent. Next, the instructor will show that

the cation (positive charge) comes first and is named a certain way, and the anion (negative charge) comes second and is named differently. More examples will be shown, including ammonium nitrate which is a common water contaminant found in agricultural areas. Many examples will be given, and students should be given an opportunity to name various compounds. Assistance may be required because many ions have different names which students may not be familiar with. Notes should also be taken for each example given. An example of a water analysis will be shown in order to show students how chemistry is involved in hydrologic research.

Lesson Relevance to Performance Task and Students:
This lesson is a great way to introduce various chemicals that students may see everyday. Because most of the chemicals we use from day to day are ionic compounds, it is important for students to understand how these compounds are formed and how we name them.

Anticipatory Set/Capture Interest:
In order to capture the students' interest, the instructor will perform a demonstration in which electricity is generated through a solution of sodium chloride.

Guided Practice:
Most of the lesson will be guided as the instructor will be discussing various topics as students take notes. Students may also refer to their textbook, which also discusses ions and how to name ionic compounds.

Independent Practice:
Students will have an opportunity to practice on their own by writing the notes and attempting to name unknown compounds.

Remediation and/or Enrichment:
Remediation- Individual IEP; work in groups rather than individually to name compounds.
Enrichment - Have students find more examples of ionic compounds found around their house. Make sure to note that many chemicals can be harmful, so extreme caution is recommended!

Check(s) for Understanding:
Throughout the class, students will have the opportunity to give their answers for unknown compounds. Students with an understanding of how to name the compounds should be able to get close to the correct answer.

Closure:
Question 1: What is an anion?

Question 2: Why does salt (sodium chloride) form perfect cubes?

Possible Alternate Subject Integrations:
Chemistry, Physical Science

Teacher Notes:
None