

## INSPIRE GK12 Lesson Plan



<b>Lesson Title</b>	Chemistry: Balancing Chemical Equations
<b>Length of Lesson</b>	One (50 minute) class period
<b>Created By</b>	Bo Cherry
<b>Subject</b>	General Science
<b>Grade Level</b>	8 <sup>th</sup> grade
<b>State Standards</b>	8 <sup>th</sup> : 1 d (Inquiry); 2a,b (Physical Science)
<b>DOK Level</b>	DOK 2
<b>DOK Application</b>	Identify Patterns, Predict, Categorize
<b>National Standards</b>	5-8: A (Inquiry); B (Physical Science)
<b>Graduate Research Element</b>	Chemistry is a fundamental part of geology, and more specifically, it plays an important role in water quality and mineralogy. Understanding the chemical reactions that govern geology is also very important.

### **Student Learning Goal:**

#### MS 8th Grade:

(Inquiry) 1 (d) Analyze evidence that is used to form explanations and draw conclusions; 2 (a) Identify patterns found in chemical symbols, formulas, reactions, and equations that apply to the law of conservation of mass. (b) Predict the properties and interactions of given elements using the periodic table of elements.

#### National Science Education Standards of Content 5-8:

(Inquiry - A) Abilities necessary to do scientific inquiry, Understandings about scientific inquiry; (Physical Science - B) Properties and changes of properties in matter.

### **Materials Needed (supplies, hand-outs, resources):**

Worksheet file (INSPIRE\_Cherry\_01.30.11\_HO); Projector; White Board; Dry Erase Markers

### **Lesson Performance Task/Assessment:**

This lesson will introduce students to several chemical equations. The handout that is given to the class contains fifteen unbalanced equations. The handout can also serve as a review in many ways such as identifying the parts of a chemical equation or various elements within the equations. The equations are separated by a thick line. The first seven equations will be balanced in class as a demonstration. The instructor will guide the students through the process while asking students questions in order to check for understanding. The electronic version of the handout will be displayed through the projector and onto the white board, where the instructor will balance the equations for the

## INSPIRE GK12 Lesson Plan



class. The student assessment will be the second half of the handout, which the students are to complete on their own.



**Lesson Relevance to Performance Task and Students:**

This lesson will teach students the basics of balancing chemical equations. It will also give students experience with common compounds and elements. The handout is designed in such a way that the questions get progressively more difficult. This will give students confidence at first, then challenge them more with each question. The lesson will also highlight many chemical reactions that are seen in nature every day.

**Anticipatory Set/Capture Interest:**

The instructor will show examples of important chemical reactions that occur in nature and in laboratories. Some of these reactions include the combustion of magnesium, oxidation of iron, and the production of carbon dioxide from combustion reactions. These examples, because they are familiar to students, will capture their interest and will be an excellent transition into the handout.

**Guided Practice:**

The first section (questions 1-7) of the handout will be guided. The students will be instructed to fill out the handout as the instructor goes over the process of balancing chemical equations.

**Independent Practice:**

Half of the handout will be guided practice. The second half (questions 8-15) are to be completed as homework. The last question on the handout is the most challenging question, so it can also be counted for extra credit. This will encourage the students to try a challenging question without worrying that it will be counted against them.

**Remediation and/or Enrichment:**

Remediation- Individual IEP; the handout with an answer key will be made available to resource teacher; Enrichment - Have students research various chemical reactions and report to the class where they are found and why they are important.

**Check(s) for Understanding:**

The instructor should observe students during the first guided section of the lesson to check for understanding. The instructor may also observe the students' handouts to check for completion before the class is dismissed.

**Closure:**

Question 1: Why can you not change the subscripts in a chemical equation?

Question 2: Show that the atomic mass of the balanced reactants is equal to the atomic mass of the balanced products.

## INSPIRE GK12 Lesson Plan



### **Possible Alternate Subject Integrations:**

Math, Geology

### **Teacher Notes:**

It can be helpful, when balancing chemical equations, to write all parts (elements) of both the reactants and the products in a table, then balance all of the numbers for the chemical equation in the table rather than writing on the equation itself. A helpful online tutorial can be found at <http://richardbowles.tripod.com/chemistry/balance.htm>. This tutorial could be used to help the instructor prior to the lesson.