**Exploring Elements**

|  |
| --- |
| **Teachers: Ms. Gallegos, Mr. Guerrero, Ms. Blonigen, Ms. Benavides, Ms. Bradshaw, Ms. Baumgartner, Ms. Barrios, Ms. Krygowski, Dr. Jeffery** |
| **Date: 10/8/15** |
| **Subject / grade level: 8th Grade Science** |
| **Materials:**   * **60 Blue; Green; Yellow highlighters** * **270 copies of *Metals, Nonmetals, and Metalloids* page** * **270 copies of Foldable Flapbook Periodic Table page** * **270 copies of the *Elements* graphic organizer**   **Per Group:**   * **15 sets of Metal-Metalloid-Nonmetal Card Sort cards** * **2 magnets (14 in all)** * **4 balloons with helium** * **Aluminum foil** * **Copper/ pennies** * **Tin** |
| **TEKS: 8.6A Compare metals, nonmetals, and metalloids using physical properties such as luster, conductivity, or malleability** |
| **Lesson Objectives:**   1. **Students will be able to classify elements as either a metal, nonmetal, or metalloid.** 2. **Students will be able to compare a sample of a metal, nonmetal, and metalloid using physical properties including luster, conductivity, malleability, magnetism, ductility, brittleness, and state of matter.** 3. **Students will be able to display the results in a graphic organizer, such as a three-flap flip book.** |
| **ENGAGEMENT**  **·**  **Metals-NonMetals-Metalloids video:** [**http://www.youtube.com/watch?v=21RC2CDm9XQ&sns=em**](http://www.youtube.com/watch?v=21RC2CDm9XQ&sns=em)  **Students will take notes during the video. A graphic organizer will be provided**    **Probing/Eliciting Questions:**   1. **On what side of the staircase are the metals located? Metals are good conductors of what? (left side of staircase; electricity) Make a note that ‘H’ is not a metal, it’s a gas.** 2. **Where are metalloids located? Which element is the exception when it comes to touching the staircase? (along the staircase; Al)** 3. **Non metals are the opposite of what? Are they shiny and malleable?** 4. **What are some physical properties of nonmetals (brittle, dull, not shiny)** |
| **EXPLORATION**   1. **Students will make a flip book to organize information on metals, metalloids, and non metals.** 2. **They will color code the three groups using blue, green, and yellow highlighters.** 3. **They will then fill in the following information for each group:**    1. **common colors**    2. **what column it is found**    3. **luster?**    4. **conductivity?**    5. **properties**   **4. Students will work with their groups to complete flip book.**  **5. The students will glue the flip book into their interactive notebooks.** |
| **EXPLANATION**  **The students will complete a handout that will help them to clarify the information they learned in exploration. They will be able to separate the information they learned into organized thoughts in the handout. The teachers will ask questions to make sure they are able to understand the information in their own thoughts or in a creative way.**      **Probing/Eliciting Questions:**  **1. What can you say about metals, nonmetals, or metalloids?**  **2. How would you compare metals and nonmetals?**  **3. Can you list the physical properties that we can use to distinguish the three groups?**    **,Metals, Non-metals, and Metalloids**    **The three major groups on the Periodic Table are the metals, nonmetals, and metalloids. Elements within each group have similar physical and chemical properties.**  **Some of the physical properties used to distinguish between the three groups are:**  **· Luster: the ability of a substance to reflect light. Usually the descriptive words are either metallic or non-metallic.**  **· Conductivity: the ability of the substance to conduct electricity. This may be tested with a conductivity meter.**  **· Malleability: the ability of the substance to be hammered into sheets without breaking.**      **Metals are-**  **· Found on the left of the zigzag line on the Periodic Table.**  **· Good conductors of electricity and heat, but some are better conductors than others.**  **· Metallic looking with a shiny luster.**  **· Malleable and can be hammered into sheets without breaking.**  **· Solid at room temperature, except for Mercury, which is liquid.**    **Non-metals are-**  **· Found to the right of the zigzag line on the Periodic Table.**  **· Poor conductors of electricity and heat.**  **· Not metallic looking, they have a dull luster and do not reflect much light.**  **· Brittle when they are solid.**  **· Solid, liquid, or gas at room temperature.**    **Metalloids are-**  **· Are found along the zigzag line on the Periodic Table. The only exception is Aluminum. It is considered to be a metal even though it lies along the zigzag.**  **· Has no set characteristics. They share properties of both metals and nonmetals.**  **· May be a good conductor of heat but are not a metal.**  **· May have luster like a metal but can be brittle.** |
| **ELABORATION**  **Students will explore samples of elements which will be located on three tables in the classroom. The objects will include: a helium balloon, a penny, a magnet...**  **Probing/Eliciting Questions:**   1. **What physical properties can you observe in each group?** 2. **What do all the metals have in common? the metalloids? the non metals?** |
| **EVALUATION**   * **The students will complete a card sort, working in cooperative small groups. The card sort will require the students to identify pictures and characteristics of the three element groups (metals, metalloids, and nonmetals) and sort the cards into these groups.**   **Probing/Eliciting Questions:**  **1. What are the characteristics that metalloids share with metals? With nonmetals?**  **2. Which elements were most difficult to sort? Why?**  **3. What is the main difference between metals and metalloids?** |