



<b>Lesson Title</b>	Element Research Activity
<b>Length of Lesson</b>	45 min
<b>Created By</b>	Kelli Dawkins
<b>Subject</b>	Chemistry
<b>Grade Level</b>	Grades 10-12
<b>State Standards</b>	1a,b,g 2a 3a,b
<b>DOK Level</b>	1,2, and 3
<b>DOK Application</b>	Hypothesize, Construct, Draw conclusions
<b>National Standards</b>	A (inquiry) ;B(physical);G ( history and nature of science)

**Graduate Research Element**

**Student Learning Goal:**

**Chemistry: MS State Standards**

**1a. Use current technologies such as CD-ROM, DVD, Internet, and on-line data search to explore current research related to a specific topic. (DOK 3)**

**1b. Clarify research questions and design laboratory investigations. (DOK 3)**

**1g. Collect, analyze, and draw conclusions from data to create a formal presentation using available technology (e.g.,computers, calculators, SmartBoard, CBL's, etc.) (DOK 3)**

**2a. Describe and classify matter based on physical and chemical properties and interactions between molecules or atoms. (DOK 1)**

- Physical properties (e.g., melting points, densities, boiling points) of a variety of substances
- Substances and mixtures
- Three states of matter in terms of internal energy, molecular motion, and the phase transitions between them

**3a. Calculate the number of protons, neutrons, and electrons in individual isotopes using atomic numbers and mass numbers, write electron configurations of elements and ions following the Aufbau principle, and balance equations representing nuclear reactions. (DOK 1)**

**3b. Analyze patterns and trends in the organization of elements in the periodic table and compare their relationship to position in the periodic table. (DOK 2)**

- Atomic number, atomic mass, mass number, and number of protons, electrons, and neutrons in isotopes of elements
- Average atomic mass calculations
- Chemical characteristics of each region
- Periodic properties (e.g., metal/nonmetal/metalloid behavior, electrical/heat conductivity, electronegativity, electron affinity, ionization energy, atomic/covalent/ionic radius)



### **National Science Educational Standards of Content 9-12**

**A- inquiry:** use appropriate techniques to gather, analyze, and interpret data; think logically and critically to demonstrate connections between investigations of data and a historical body of knowledge.

**B-matter** is made of minute (unseen) particles of atoms; these components have measurable properties.

**G-individuals and teams** have contributed and will continue to contribute to the scientific enterprise; use logical arguments to gain the best explanations; be consistent with observational evidence and make accurate predictions about systems being studied.

**Materials Needed (supplies, hand-outs, resources):** Guideline sheet containing research criteria.

**Lesson Performance Task/Assessment:**

**Summative Assessment:** Students will be evaluated on a power point presentation of an element of their choice.

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

The inquiry activity will aid students in learning about a specific element. The student will apply knowledge of physical and chemical properties to their specific element. Common compounds and uses of the element will also be explored.

**Anticipatory Set/Capture Interest:**

The teacher will display an interactive periodic table of the elements on the smart board. The teacher will discuss some commonly known elements as well as a few unfamiliar elements to peak the interest of the students.

**Guided Practice:**

The teacher will hand out the research criteria for each power point slide. All information needed about an element will be discussed. A previous presentation will be shown to the students for reference of an exceptional project.

**Independent Practice:**

Each student will research and design a power point presentation for his/her chosen element over a period of 2 weeks. The students will work on the project individually in the classroom for only one day – going to the computer lab and/or library.



**Remediation and/or Enrichment:**

**Remediation:** individual IEP; partner help throughout the less; shorten parts of the assignment; focus on few processes

**Check(s) for Understanding:**

Name the scientist who discovered your element.

Why is it important to know physical and chemical properties about every element that has been discovered?

**Closure:**

Students will present their element power point presentations to the class. Students will focus on the interesting facts and usages of their element.

**Possible Alternate Subject Integrations:**

Computer technology, English, and research.

**Teacher Notes:**

Element project guideline/grading rubric attached.