

# Minnesota Writing Project

## --- Demonstration Lesson Template ---

**Title of lesson:** Design an Element Mini Book Project

**Suggested grade/age:** Grade 10 -11

**Subject:** chemistry

**Unifying Concepts:** Systems, Form and Function, Organization, Evidence and Models, Energy

**Approximate time needed to complete lesson:** Eight 55 minute periods

### **Learning objective(s) and significance of lesson:**

**Through a series of writing in multiple genres, this lesson leads students to develop a conceptual understanding of science concepts. This understanding is expressed in a completion of a science project: An Element Mini Book**

**Learning Objective:** Students will be able to:

1. Demonstrate an understanding of the structure of matter, the properties of matter, and how the structure of matter determines the properties of matter.
2. Demonstrate an understanding of the mechanics of writing a scientific paper following ACS guidelines. This includes learning how to communicate well with graphs, tables, diagrams and other visual materials.

### **Standards Addressed**

#### **Minnesota Academic Standards: Science Standards**

Code:

#### **The practice of Science and Engineering**

9.1.3.3.2 - Communicate, justify and defend the procedures and results of a scientific inquiry or *engineering design* project using verbal, graphic, quantitative, virtual or written means.

9.1.3.4.3 - Select and use appropriate numeric, symbolic, pictorial, or graphical representation to *communicate* scientific ideas, procedures and experimental results.

#### **Physical Science - Matter**

9.2.1.1.3 - Explain the arrangement of the elements on the Periodic Table, including the relationships among elements in a given column or row.

9.2.1.2.3 - Describe a chemical reaction using words and symbolic equations

#### **College and Career Readiness Anchor Standards for Writing**

##### *Text Types and Purposes*

2. Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.

3. Write narratives and other creative texts to develop real or imagined experiences or events using effective technique, well-chosen details, and well-structured event sequences.

##### *Writing Process: Production and Distribution of Writing*

4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

### *Research to Build and Present Knowledge*

7. Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.

8. Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.

9. Draw evidence from literary or informational texts to support analysis, reflection, and research.

### *Range of Writing*

10. Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences.

### **Summary/Overview**

1. This Unit is the second unit of a yearlong chemistry course. This is usually in Quarter 1
2. This lesson usually follows the first unit on **safety**, basic lab techniques such as **separation** techniques, changes in properties **and evidence of a chemical** reaction.
3. Assessment and Anchor **probes** are given to the students to access prior knowledge. This can be in form of demonstration experiment, quick writes.
4. Students begin to explore and develop writing skills by implementing the school –wide writing across the curriculum as part of our Action/Inquiry School improvement model. Students respond to various writing prompts.
5. Assignment: Students are expected
  - a. to adopt an element from the Period table. (They choose which one they want to work with or one is assigned to them).
  - b. gather relevant data about the element using different types of resources.
  - c. write a mini book for their assigned audience using the information gathered
  - d. include essential characteristics of the element –name, symbol, history, structure, properties, reactions and uses, among others.
  - e. Use appropriate words, pictures, drawings and design.
  - f. Provide rationale/ reasoning for their choices
  - g. All the essential components of a book and book design are to be applied.
  - h. Be creative with their book.
  - i. Present their finished work to the class or designated group (*the designated group could be a lower grade level, another class, an ELL class or teacher PLC groups*).
6. Assessment: Formative and Summative using Writing Rubric, Presentation Rubric, Tests

### **Related Resources:**

(What technology, articles, books, or supplies do you recommend?)

#### Books

1. Harris, C: The Joy of Chemistry: The Amazing Science of Familiar Things"
2. Robertson, W: Stop Faking It, Chemistry Basics"
3. Douglas, R; Klentschy M.P and Worth K: Linking Science and Literacy in the k-8 Classroom
4. Hammerman, E & Musial D: Integrating Science With Mathematics & Literacy
5. Lantz, H. B: Rubrics for Assessing Student Achievement in Science grades K-!2
6. Heiserman, D.L: Exploring Chemical Elements and their Compounds
7. Keeley, P, Eberle F & Farrin L: Uncovering Student Ideas in Science, 25 Formative Assessment Probes Vol. 1
8. Shelley, M.W: Frankenstein

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