Cosmic Chemistry: Understanding Elements

A Historical Overview: Mendeleev and the Periodic Table

STUDENT ACTIVITY: QUESTIONS AND STRATEGIES

IT'S ALL IN THE FAMILY (choose one)

1. Draw a family tree for your immediate and extended family. Include photographs if available.
2. Conduct an oral history interview of a friend or family member. Steps on how to do this are located at http://www.kbyu.org/capturingpast/. Follow the procedure entitled "Capturing the Past: How to Prepare and Conduct an Oral History Interview."

THE TRIAD MODEL

1. Explain how Johan Dobereiner classified elements.

2. Why was the Triad model eventually not useful?

THE LAW OF OCTAVES

1. What did John Newlands use to arrange the elements?

2. Why was his model called the Law of Octaves?

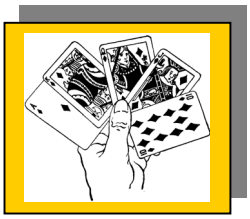
3. Give two reasons why Newlands' law was not a good model.

MENDELEEV

1. What question did Mendeleev ask that formed the basis of today's periodic table?

2. State Mendeleev's periodic law.

3. Why did Mendeleev leave hydrogen out of his game of cards?



4. Describe how Mendeleev placed his element cards for the first seven elements.

5. If Mendeleev found an element with similar physical or chemical properties as another element, he placed it _____ to it.

6. What was the first problem that Mendeleev encountered?

7. How did he solve this problem?

Mendeleev predicted there was an element with properties similar to boron and aluminum with atomic mass between that of calcium and titanium. Mendeleev in fact predicted the properties of scandium, which was not discovered until 1878. Mendeleev also predicted properties he called “ekasilicon,” which was eventually discovered in 1886.

1. Which of the examples from above was an extrapolated prediction? Which was an interpolated prediction?

2. Give another example of an interpolated and extrapolated prediction made by Mendeleev.

3. Find Mendelevium on the Periodic Table of Elements. How is this element classified? Where can it be found?