Lesson Plans   CMST Institute

8-9-2006

Periodic Table Trends with TI-Calculator

Brian Minchen
The College at Brockport

1. Tell me who you are

Name: Brian Minchen
Grade level(s)/Subject taught: 11th Grade Chemistry
Objectives: By the end of the lesson, the students will know at least three trends on the periodic table (named for its repeating nature). There are many trends on the table that allowed early scientists like Dimetri Medeleev to predict the properties of some elements that haven't been discovered.

1. *Write* the Mathematical Concept or "key idea" that modeling will be used to teach

<div align="center">and/or…</div>

Write the Science Concept or "key idea" that modeling will be used to teach

The concept that trends on the periodic table can be extrapolated and interpolated to predict characteristics of unknown elements. This is how early scientists predicted unknown (at the time) elements.

Materials:
Periodic Table
TI-84 Calculator
LCD projector

"…a rich **one-page, single-spaced**, description or a *vision* of your best thinking…"

Prompts:
1. How will you assess the prior knowledge of the student?
2. How will you begin the lesson?
3. What are the teacher and students doing every 5-10 minutes? (Teacher Actions and Student Actions
4. How will you assess the learning for the lesson?

Using _____ **I plan on having my students…**
(software / modeling package(s))

I will begin class with the students coming in and sitting at their desks. In front of them will be a periodic table as it was in the mid 1800's. There will be spaces for Gallium, Germanium and Scandium. It will be their job to give properties of these unknown elements and to understand how this is done. This is exactly how early scientists predicted properties of the elements.

The students will be instructed to use the TI-84 to plot properties such as density, electronegativity and ionization energy. They are to use an appropriate regression method for calculating the unknown values.

These values will be collected by the teacher and given to the class as a whole. The teacher will lead the class in a discussion of the various properties and the general trends that they have observed through their research.

The class will come to a consensus on the value they think is appropriate, and then research the correct values and determine their percent error.

The teacher will then give them a new element, unlike and not close to any known elements. The class will be responsible for taking their equations that they figured out and determining properties for this new element. The teacher will use these values to gauge the students on how well they understood the lesson.

This exercise serves two purposes. First, it shows a history lesson for how scientists estimated properties of elements that hadn't been discovered yet. Second it shows the structure of the periodic table, and that properties repeat themselves periodically—hence the name. The TI-84 will be a powerful tool to facilitate this learning.