

Cosmic Chemistry: An Elemental Question

Exploration of a Problem: Making Sense of the Elements

STUDENT ACTIVITY

1. As you are making sense of these elements, record your ideas for organizing them and the results of that organization.
2. Make a display showing your group's organization scheme. Summarize the primary identifying characteristic(s) you used to classify the elements. Identify any possible sources of error and any additional information or data that would assist you in deciding the appropriate placement for each element.
3. Read and discuss the Student Text, "A Historic Overview: Mendeleev and the Periodic Table." Consider the processes Mendeleev used in his systematic organization of the periodic table. Now think about the manner in which he used this model to predict the presence of certain elements that had not yet been discovered. Scientists often make predictions with the use of a model. The model can be the result of external data that has been gathered and recorded. By studying a model, scientists often can use trends indicated by known data to predict missing information. This process is much like what you did when you solved the jigsaw problem in the previous Student Activity, "The Search for Critical Questions." Scientists call this *interpolation*. Attempt to interpolate information about the missing pieces of your periodic table model. Describe your predictions.
4. Read and discuss the Student Text, "The Modern Periodic Table." Remember that Mendeleev arranged his historical table in order of increasing atomic mass. Look carefully at iodine (I) and tellurium (Te) on the modern and Mendeleev tables. Why do they differ? Which arrangement follows group descriptions better? Which arrangement is more useful? Why?
5. Following the class discussion, in your original group devise a possible process for solving a problem of organizing information such as this. For each step write the questions you should ask to successfully complete the step. As you do this, consider the best procedures to follow and the most valuable questions to ask in order to minimize error. Remember that you should be able to clearly communicate the processes you are using to other scientists. Keep a copy of this process for the next activity.

