

Constructing A Periodic Table
"The Mendeleev Game"

Materials Needed: 1 deck of cards, 1 terms sheet, 3 partners

During the 19th century chemists made a large number of careful observations of the elements and their compounds. A major goal was to find an arrangement of the elements that would provide some organization for these observations. Some of the first regularities proved too limited. Other proposals were shown to be incorrect. Step by step, better arrangements were achieved. Additional observations and more precise measurements resulted in an arrangement of the elements by the Russian chemist Dimitri Mendeleev.

In this activity you will attempt to replicate Mendeleev's reasoning in developing the periodic table. Each card in your deck represents an element. Some of the known chemical and physical properties are listed on each of the cards. You are to try to arrange the cards in a logical sequence based upon one or more of the element's properties. You are trying to form an arrangement that results in repeating-sequence relationships. When you are done, answer the following questions.

1. What criteria worked best in developing a pattern for your periodic chart?
2. What is the general tendency in atomic radius as you go left to right? Top to bottom?
3. What is the general tendency in atomic mass as you go left to right? Top to bottom?
4. What is the general tendency in density as you go left to right? Top to bottom?
5. What is the general tendency in melting point as you go left to right? Top to bottom?
6. Use the tendencies exhibited in your chart to predict each of the eight characteristics of the missing element in group 6, period 3.

IONIZATION ENERGY

ATOMIC
WEIGHT

ATOMIC
RADIUS

FLUORIDE

OXIDE

DENSITY

MELTING
POINT

HYDRIDE