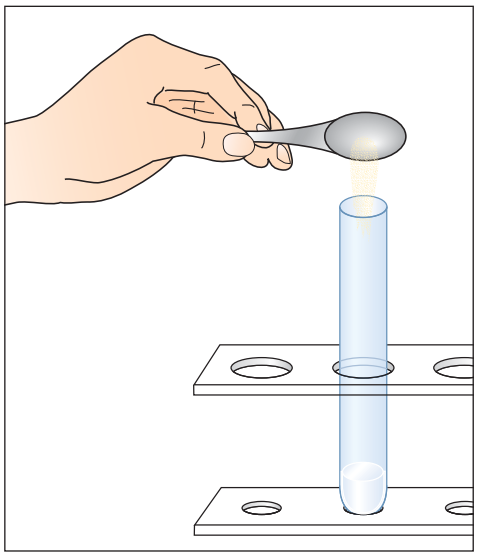
a) Test the samples of each element with the electrical conductivity apparatus. Record whether the element conducts electric current, (yes) or (no).

b) Based on your initial observation and the results of the conductivity test, can you suggest a way to group the elements? Describe an arrangement in your log.

5. Another property of each element known to Mendeleev was how it reacts with an acid.

Pour 5 mL of 3 *M* hydrochloric acid (HCl) into each of nine small test tubes. (3 *M* is an indication of the concentration of the acid.) Use a scoop or tongs to remove a small portion of each element from the jar and add it to the hydrochloric acid. It is important to add the hydrochloric acid to the test tube first so that you will not be surprised by a reaction that occurs when you pour acid over a reactive element. Place a piece of white paper in the background behind the test tube and observe the reaction between the element and hydrochloric acid by looking through the side of the test tube.



a) Test a small sample of each element for its reaction with hydrochloric acid (HCl). Record whether it reacts with the acid, (yes) or (no).

b) For those elements that do react, try to determine whether all show the same type of reaction. (Do they all do the same thing?) Compare the relative vigor of the reactions. If the reaction is vigorous, include a + sign next to your "yes." If the reaction is weak, place a − sign next to your "yes."

6. Dispose of the contents of the test tubes and clean the test tubes as directed by your teacher.

a) Now that three columns of observations are included in the table, describe a way to arrange the different elements.

7. Place a small amount of each sample on a watch glass. Use a magnet and test the element to see if it is attracted to the magnet.

a) Record your observations in your table.

8. A metal is generally a solid that is shiny, malleable, and a good conductor of heat and electricity. Nonmetals have a wide range of properties. Some are dull and brittle, but others, like diamond, are hard and brilliant, and still others are gases or liquids. Most are poor conductors of electricity. Classify each of the elements you observed as either a metal or nonmetal.

a) Record your observations in the table in your *Active Chemistry* log.

9. When elements combine with oxygen they form oxides. Another way to determine whether an element is a metal or nonmetal is to see how the oxide reacts with a universal indicator to determine the pH.