History of the Periodic Table

In the early 19th century, a scientist named Johann Döbereiner (1780–1849) noticed that strontium's atomic mass fell exactly between the atomic masses of calcium and barium. Investigating this further, Döbereiner found that other elements followed this pattern, and so he began to group elements into "triads" and in 1817 he put forward his law of triads. Other chemists built on Döbereiner's work to observe that elements with similar atomic masses also exhibited similar properties. By the mid-19th century, chemists across the world rushed to organize the elements into a chart that would help them make sense of what they were observing in their experiments.

In 1860, Mendeleev arranged a periodic table based on atomic weights and a standardized method for determining these weights. The most remarkable aspect of Mendeleev's periodic table, and the reason why his name has endured, is that Mendeleev left spaces open for elements that were not yet discovered. Later discoveries proved that his predictions were correct. Elements, including germanium and boron, fit neatly into Mendeleev's table. It is also important to note that not only did Mendeleev predict the existence of these missing elements, but he also properly predicted their physical and chemical properties. Perhaps most remarkable of all, Mendeleev did all this without knowing the structure of the atom.

Because the proton, the neutron, and the electron had not yet been discovered, Mendeleev initially sorted the elements by atomic mass. One of the main patterns Mendeleev observed was the repeating pattern of reactivity with oxygen. In groups of eight, he observed that as mass increased, so did the number of oxygen atoms that would react with a given element. While Mendeleev's table was mostly successful, a few elements did not seem to make sense in the positions he assigned.

It turns out that some of the imperfections in the Mendeleev periodic table stemmed from using atomic mass as his way of ordering the elements. It would take until 1913, when British physicist Henry Moseley (1887–1915) began experiments exploring the newly discovered nucleus of the atom. In his experiment, Moseley shot a stream of electrons at atoms of different elements. Each element gave off a different X-ray signature, and this X-ray signature was related to its position on the periodic table. From his data, he was able to determine a whole number, Z, for each different element; Moseley called this the "atomic number." Based on his findings, Moseley proposed that the elements should be ordered based on atomic number, and that elements with the atomic numbers 43, 61, 72, and 75 had yet to be discovered. We now know that the atomic number is the number of protons, which were discovered shortly after Moseley's death by his mentor, Ernest Rutherford (1871–1937). Henry Moseley's work provided amazing insight into the periodic table. Unfortunately, Moseley was killed at age 27 in the Battle of Gallipoli in World War I, before he was able to reap the rewards of his discovery.

The last major change to the periodic table was in the 1940s, when Glenn T. Seaborg (1912–1999), a chemist at the University of California, Berkeley, moved heavy elements to the bottom of the table. On the periodic table we use today, there are two rows and 14 columns separate from the rest of the elements. Seaborg recognized that these two series, called the "lanthanide series" (also known as the "rare Earth elements") and the "actinide series," belonged next to the transition metal block of the periodic table. Because this would make the periodic table too long to fit on a sheet of paper, Seaborg moved these blocks to the bottom of the table.

The History of the Periodic Table Timeline

Group Members:

1. ______________________
2. ______________________
3. ______________________
4. ______________________
5. ______________________
6. ______________________

Ancient Times

A number of elements *(such as platinum, tin and zinc)* have been known from ancient history as they are found in their native form. The 4 elements were earth, water, air and fire.

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