PHOTO: MIKE WALKER

The United Nations has designated 2019 as the International Year of the Periodic Table of the Chemical Elements (www.iypt2019.org) and, with it, the 100th anniversary of the founding of the International Union of Pure and Applied Chemistry. The organizing committee declared that "The Periodic Table of Chemical Elements is one of the most significant achievements in science, capturing the essence not only of chemistry, but also of physics and biology." Indeed, many nonscientists recognize the periodic table simply by the distinctive shape of its border, but within this border lie many aspects of science beyond chemistry. Science is about the interplay of experimental results and theory. A sufficient number of elements needed to be discovered and their properties and reactivity understood before systematic trends could be inferred. Science is also fundamentally about making testable predictions. Part of the success of Dmitri Mendeleev's original table published in 1869 was that he left gaps for the placement of undiscovered elements. Mendeleev predicted some properties of these elements, setting off a chain of scientific testing of hypotheses. The structure of the periodic table was later understood to arise from quantum mechanics. The elements themselves are produced by a complex chain of stellar nucleosynthesis processes, and the frontier of the periodic table—the search for stable superheavy elements—tests the limits of experimental atomic physics.

A large periodic table is frequently displayed in classrooms (not just chemistry classrooms) but is often placed too high on the wall for anyone to make out more than the element symbols and atomic numbers. Periodic tables hung this way really serve as banners or flags and declare to anyone who enters the room that "We're doing science here."

Theodore Gray's literal periodic table of elements