

The Periodic Table in Earth and Sky

A Study of the Elements in Minerals and Astronomy

1 2 3 4 5 6 7

Period numbers 1-7

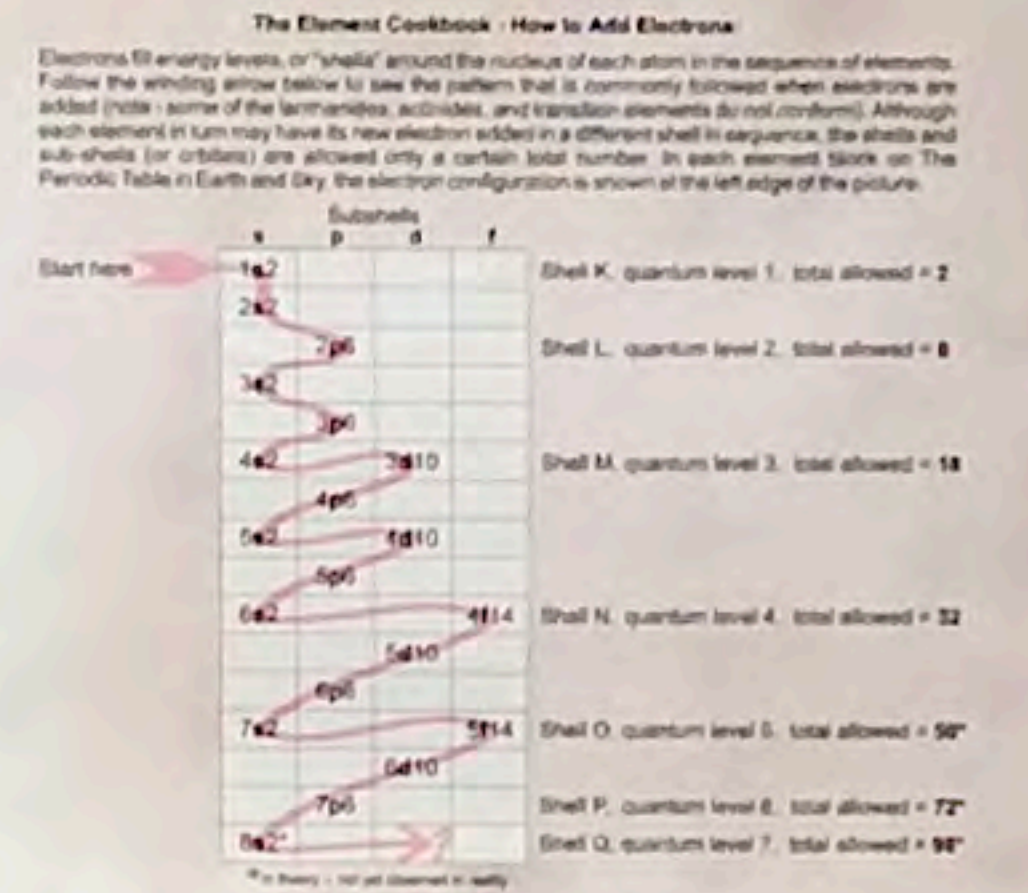
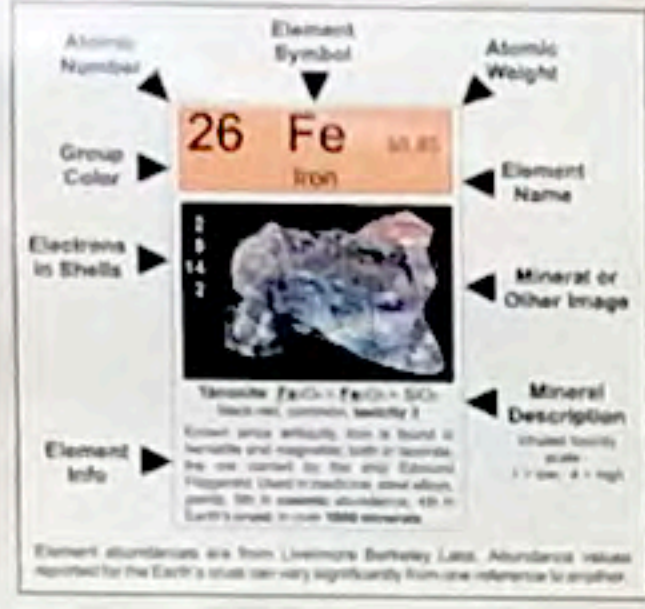
1 H Hydrogen	2 He Helium
3 Li Lithium	4 Be Beryllium
11 Na Sodium	12 Mg Magnesium
19 K Potassium	20 Ca Calcium
37 Rb Rubidium	38 Sr Strontium
55 Cs Cesium	56 Ba Barium
87 Fr Francium	88 Ra Radium



Dmitri Mendeleev, father of the Periodic Table, was born in Siberia, on 7 February, 1834. He was the youngest of the family having about 14 (records differ to 15) other brothers and sisters. His father, who died when Dmitri was eight years old, had been the director of the local school. His mother became manager of her family's glass factory in order to support the family, offering Dmitri the chance to learn both the chemistry and art of making fine glass. His uncle also took an interest in Dmitri, teaching him about the new discoveries of science. Dmitri entered the university at St. Petersburg in 1850, but in his first year he became ill with tuberculosis. He was forbidden to bed for a year, but continued his studies at home, graduating on time and with a medal for being first in his class. His doctors, though, continued to predict he would only have 2 years more to live. He did not heed the prognosis, however, and lived a life of intense music to him. He did not leave the university until he became a lecturer at St. Petersburg. Filled with a love for teaching that brought crowds of both students and the public to hear him whenever he spoke. He taught chemistry and agriculture, painted and wrote, and even flew in a balloon 13 years before the Wright brothers first flew in 1903) to better observe a solar eclipse.

In 1869, after spending 13 years formulating his ideas, he published a table of the 63 known elements (no noble gases were included, since none had been discovered by that time) arranged in a systematic way. The table actually resembled the chart by placing all signs of paper, as in a card game, each one with an element and its properties written upon it. His name, "Periodic Table of the Elements" not only brought some order to the study of the elements, but allowed him to predict the existence and properties of 3 elements, not yet discovered, that appeared to have places waiting for them in the table Dmitri was 35 years old at the time.

Continuing through another 36 years until his death in 1907 at age 73, the man who was not supposed to live to see his 22nd birthday gained awards and honors from around the world. His only wife, Thea, is dedicated to the memory of a mother by her youngest offspring. Constructing a factory she could educate him only by her own work. She instructed by example, connected with love, and... understood how... much there is still to be learned!



19 K Potassium	20 Ca Calcium	21 Sc Scandium	22 Ti Titanium	23 V Vanadium	24 Cr Chromium	25 Mn Manganese	26 Fe Iron	27 Co Cobalt	28 Ni Nickel	29 Cu Copper	30 Zn Zinc	31 Ga Gallium	32 Ge Germanium	33 As Arsenic	34 Se Selenium	35 Br Bromine	36 Kr Krypton														
37 Rb Rubidium	38 Sr Strontium	39 Y Yttrium	40 Zr Zirconium	41 Nb Niobium	42 Mo Molybdenum	43 Tc Technetium	44 Ru Ruthenium	45 Rh Rhodium	46 Pd Palladium	47 Ag Silver	48 Cd Cadmium	49 In Indium	50 Sn Tin	51 Sb Antimony	52 Te Tellurium	53 I Iodine	54 Xe Xenon														
55 Cs Cesium	56 Ba Barium	57 Lu Lutetium	58 La Lanthanum	59 Pr Praseodymium	60 Nd Neodymium	61 Pm Promethium	62 Sm Samarium	63 Eu Europium	64 Gd Gadolinium	65 Tb Terbium	66 Dy Dysprosium	67 Ho Holmium	68 Er Erbium	69 Tm Thulium	70 Yb Ytterbium	71 Lu Lutetium	72 Hf Hafnium	73 Ta Tantalum	74 W Tungsten	75 Re Rhenium	76 Os Osmium	77 Ir Iridium	78 Pt Platinum	79 Au Gold	80 Hg Mercury	81 Tl Thallium	82 Pb Lead	83 Bi Bismuth	84 Po Polonium	85 At Astatine	86 Rn Radon
87 Fr Francium	88 Ra Radium	89-102 (all in period 7, group 3)	103 Lr Lawrencium	104 Rf Rutherfordium	105 Db Dubnium	106 Sg Seaborgium	107 Bh Bohrium	108 Hs Hassium	109 Mt Meitnerium	110 Uun Ununbium	111 Uuu Ununtrium	112 Uub Ununbium	113 Uut Ununtrium	114 Uuq Ununquadium	115 Uup Ununpentium	116 Uuq Ununhexium	117 Uuh Ununheptium	118 Uuo Ununoctium													

Color Key and Descriptions of Element Families

- Non-Metals**: Elements that do not exhibit the properties of metals, such as high luster or conductivity. Non-metals are located in the upper right-hand corner of the periodic table.
- Alkal Metals**: Elements that all have electron configurations of ns¹ (outer electron). All react with water, producing hydrogen gas and a hydroxide.
- Alkal Earth Metals**: Elements that all have electron configurations of ns² (outer electron). All are strong reducing agents. They react with water.
- Transition Metals**: Elements forming the bulk of the periodic table, showing the d-block (groups 3-10). They are strong transition metal complexes.
- Metals**: Elements that are typically high strength, lustrous, malleable, ductile, and good conductors of heat and electricity.
- Metalloids**: Elements with chemical and physical properties between those of metals and non-metals. There are several such elements.
- Halogens**: Elements having electron configurations of the form ns² np⁵. They are highly reactive, forming compounds by gaining one electron or by losing one.
- Inner Metals**: Elements that complete each row of period. They have electron shells fully occupied. Noble gases are chemically inert and form weak compounds.
- Inner Actinides**: Elements beyond the actinide series, located in the lower right-hand corner of the periodic table. They have electron shells fully occupied.
- Lanthanides**: Elements that complete each row of period. They have electron shells fully occupied. They are chemically inert and form weak compounds.
- Actinides**: Elements beyond the actinide series, located in the lower right-hand corner of the periodic table. They have electron shells fully occupied.