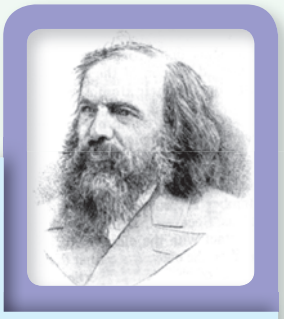
# Dmitri Mendeleev



Dmitri Mendeleev was born on the 8th of February 1834 in Siberia, Russia. His father who was a teacher of the arts and politics, died when he was only thirteen. He was one of a large family and is thought to possibly have had 17 brothers and sisters. Due to his father's death and a failed family business (a glass factory that burnt down) the family were very poor. Despite this, his mother wanted him to be educated at a higher level so she moved the family to St Petersburg in order for Dmitri to attend school. After graduating he became a teacher in the area of science.

His passion was chemistry and he studied the **capillarity of liquids** (ability of a liquid to flow in a narrow space without any suction or pumping, like when water moves against gravity up a straw placed in a glass of water), the **components** of petrol and the **spectroscope** (a device that uses light to identify unknown materials).

Because chemistry at the time was so disorganised, Mendeleev saw a need to establish a set of rules and guidelines that would be universal (able to be used across the world). He started by writing two very successful text books that included all of his chemistry knowledge. However he felt that this wasn't enough and that the concepts of chemistry were too broad and unlinked.

In 1869 he started to write a system that ordered the elements as these were the main concept behind a lot of other chemistry. At the time there were only 65 known elements. He made a card for each element (about the size of a playing card) and wrote each element's known **properties** (features) onto the card. He then started arranging them on his desk into different patterns that linked the elements together using their similar properties. He created many different layouts until he grew tired and eventually he fell asleep. Once he woke up he had **subconsciously** seen a pattern (his brain had carried on trying to find the best pattern while he was asleep – he was not aware that he was doing it). "In a dream I saw a table where all the elements fell into place as required. Awaking, I immediately wrote it down on a piece of paper". He used the increasing **atomic weight** of each element to order them.

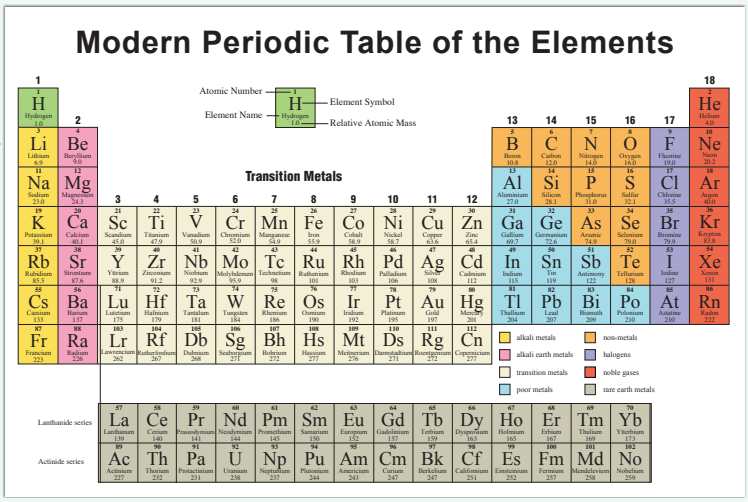
Other people had also tried to order the elements in a table but theirs had been unsuccessful due to them containing errors. Mendeleev even predicted the presence of eight new elements and their properties. All eight of these were later discovered which made him very famous and his table became known and used worldwide.

While he is best known for his creation of the first periodic table he also contributed to other areas of science including: geology, physics, meteorology, explosives technology and fuels development. He even introduced the **metric system** (use of units like metres and kilograms) to Russia.

Mendeleev died at the age of 73 from the flu. He has been **commemorated** with a crater on the moon, element number 101, numerous streets, buildings and awards being named after him.

The Periodic Table we currently use is very different to the one Mendeleev produced. Many people since Mendeleev have worked on its layout, organisation and the discovery of elements and their properties.

The standard table that we use today has 18 columns and 7 rows organised according to size, properties and similarity to other elements. There are 118 elements known at present on the table and all of these have either been discovered in nature (the first 98 exist in nature) or **synthesised** (made in a laboratory) by man – however there is some **dispute** (disagreement) about whether elements 113, 115, 117 and 118 have actually been produced or not.

***Mendeleev's First Periodic Table of the Elements (1869)***

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Ti | 50 | Zr | 90 | ? | 100 | | | | | | |
| | | | | | | V | 51 | Nb | 94 | Ta | 182 | | | | | | |
| | | | | | | Cr | 52 | Mo | 96 | W | 186 | | | | | | |
| | | | | | | Mn | 55 | Rh | 104.4 | Pt | 197.4 | | | | | | |
| | | | | | | Fe | 56 | Ru | 104.4 | Ir | 198 | | | | | | |
| | | | | | | Ni = Co | 59 | Pd | 106.6 | Os | 199 | | | | | | |
| H | 1 | | | | | Cu | 63.4 | Ag | 108 | Hg | 200 | | | | | | |
| | | Be | 9.4 | Mg | 24 | Zn | 65.2 | Cd | 112 | | | | | | | | |
| | | B | 11 | Al | 27 | ? | 68 | U | 116 | Au | 197? | | | | | | |
| | | C | 12 | Si | 28 | ? | 70 | Sn | 118 | | | | | | | | |
| | | N | 14 | P | 31 | As | 75 | Sb | 122 | Bi | 210? | | | | | | |
| | | O | 16 | S | 32 | Se | 79.4 | Te | 128? | | | | | | | | |
| | | F | 19 | Cl | 35.5 | Br | 80 | I | 127 | | | | | | | | |
| Li | 7 | Na | 23 | K | 39 | Rb | 85.4 | Cs | 133 | Tl | 204 | | | | | | |
| | | | | Ca | 40 | Sr | 87.6 | Ba | 137 | Pb | 207 | | | | | | |
| | | | | ? | 45 | Ce | 92 | | | | | | | | | | |
| | | | | Er? | 56 | La | 94 | | | | | | | | | | |
| | | | | Yt? | 60 | Di | 95 | | | | | | | | | | |
| | | | | In | 75.6? | Th | 118? | | | | | | | | | | |