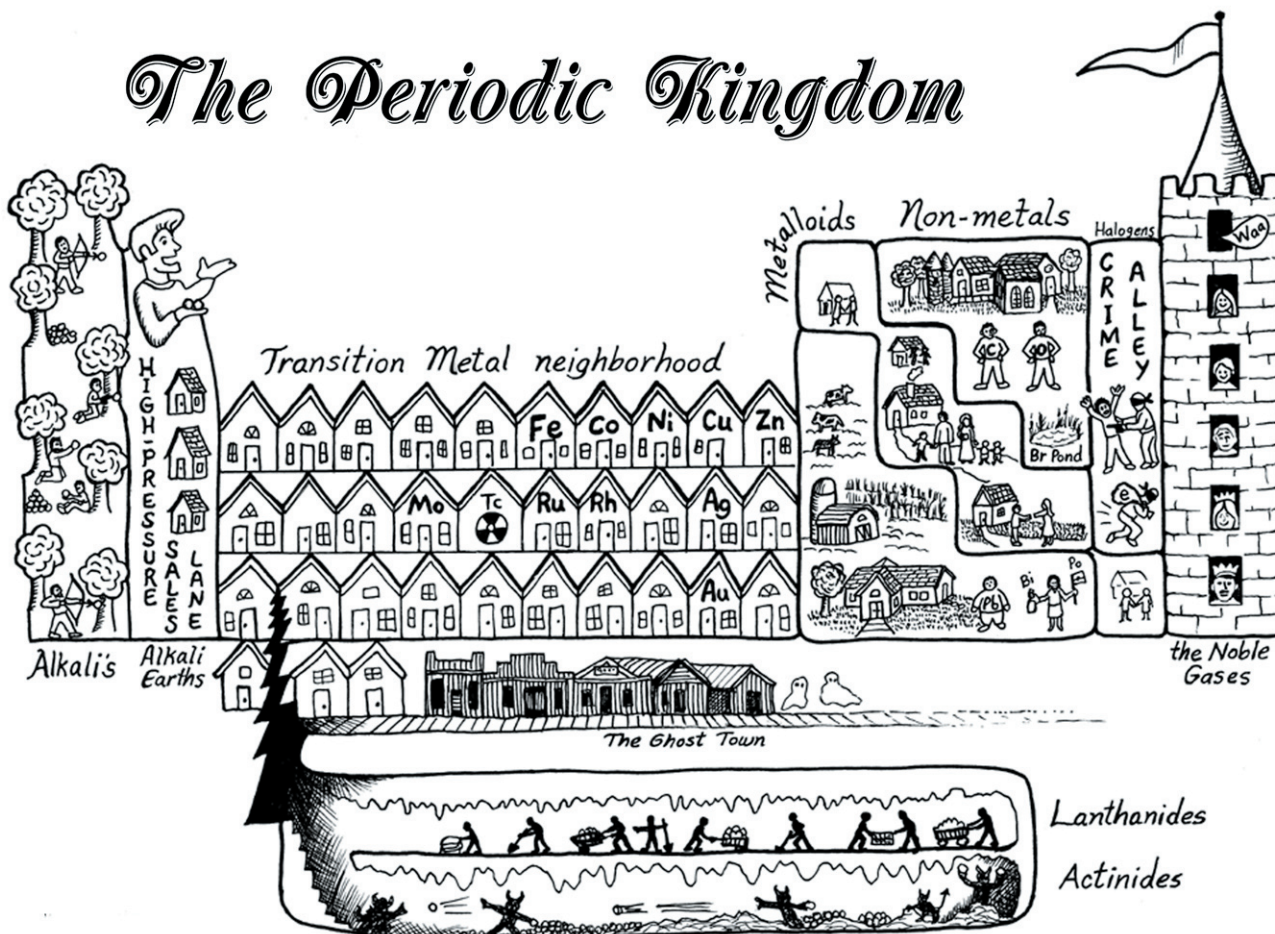


# The Periodic Kingdom



A silly story about real chemistry...

Once upon a time, in a land all around us, was the Periodic Kingdom. The royal family of the kingdom lived on the eastern shore in their tall castle tower. They were the Noble Gases: King Radon, Queen Xenon, Prince Krypton, Prince Argon, Princess Neon, and baby Helium. The Noble Gas family were the most peaceful rulers a kingdom could hope for. They never got upset and never argued with anyone. They remained calm no matter how much turmoil was going on around them.

There was one square mile of land just outside the castle. This land had been divided diagonally, split between two large families. The Metal family set up their homestead in the south western corner. The other family, who lived in the northeast, had such a long last name that no one could remember it, so they became known simply as the Non-metals. Over the years, some members of the Metal family had married members of the Non-metal family. They lived right in the middle, along the diagonal dividing line. This new family was half Metal and half Non-metal, so they became known as the Semi-metals. After several generations, one of the grandchildren decided he did not like being called a name that sounded like "half-breed" so he decided to change the family surname to Metalloid.

In general, the members of the Non-metal family were very conscientious and hard-working. (Without carbon and oxygen, for example, life on earth could not exist.) However, one section of the Non-metal family had gone bad. They all lived on the street nearest to the castle tower. The people of the kingdom called this street "Crime Alley." These poor wretches were always in need. Desperate to gain an electron, they would stop at nothing.

They would even steal or kill to get one. Ashamed to be associated with them, the Non-metals began calling them by a different name: the Halogens. Some folks say this is a sarcastic reference to a halo. Others say the name is based on a statement someone made about them not being worth their salt. Either way, stay out of their neighborhood if you know what's good for you!

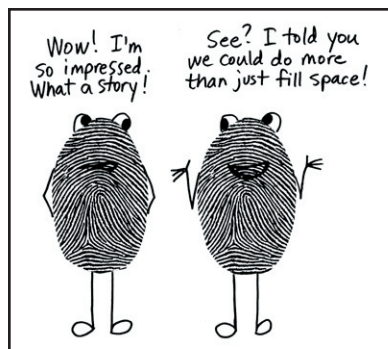
Situated in the middle of the kingdom was the town, with all the honest, hard-working laborers. Many of them were miners who earned their living digging for iron, cobalt, nickel, copper and zinc. There were also craftsmen such as silversmiths and goldsmiths. Notable women of the town included Molly, Ruth and Rhoda. Between Molly and Ruth lived a mysterious neighbor who was rarely at home. The strange geometric figure posted on his door made Molly and Ruth nervous, and they told everyone to stay away from it.

On the very western edge of the kingdom lived a band of outlaws named the Alkali Brothers. These outlaws weren't the ordinary type-- they were more like Robin Hood and his band of merry men. They represented generosity gone wrong. The members of the Alkali family have an extra electron they would like to get rid of, but instead of being nice and simply offering it to the poor, they forced the poor to take it whether they wanted it or not. The Alkalis would resort even to violence, if necessary, to get a poor atom to accept an electron! Anyone who came near an Alkali was in danger of being forced to take an electron. (Except the Royals, that is. They lived an enchanted life, unaffected by any of the troubles around them.)

Some of the Alkali outlaws eventually recognized the errors of their ways, tried to reform, and moved a little closer to town. Someone said they had "come back down to Earth" (meaning that they had become more realistic about life) so they added "Earth" to their name and called themselves the Alkali Earth family. However, they still had that Alkali blood running in their veins and that made them pretty pushy. They each had two electrons to give away and they really knew how to pressure folks into taking them!

On the south side of the kingdom was the Ghost Town. The houses all sat there with names on the doors, but mostly there was never anyone home. Once in a while someone would come into town with wild tales about having seen someone in one of the houses for a split second before they disappeared into thin air.

The strangest part of the kingdom was underground. You could only get to it by way of a narrow crack between two of the streets in town. The crack led down into an underground cavern populated by two separate families: the Lanthanides and the Actinides. The Lanthanides were friendly and spent their days mining for rare metals. The Actinides were a treacherous species, constantly throwing dangerous pieces of radioactive atoms all over the place. Beware the Actinides!

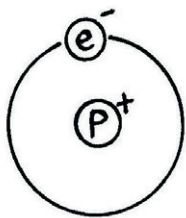


# H 1

**Hydrogen**

1.0

*Greek: "hydro-gen" (water-maker)*



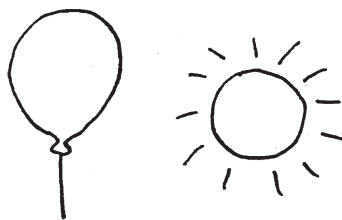
- Has no neutrons.
- Most abundant element in the Universe.
- Used in rocket fuel and fuel cells.

# He 2

**Helium**

4.0

*Greek: "helios" (sun)*



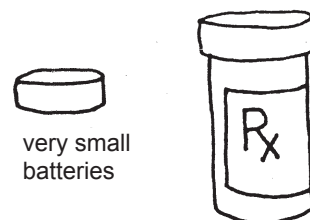
- Used in balloons, blimps and scuba diving tanks.
- Discovered in the sun in 1895 using a spectrometer.

# Li 3

**Lithium**

6.9

*Greek: "lithos" (stone)*



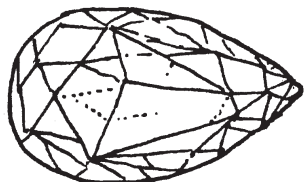
- Used in batteries, lubricants, medicines, and nuclear bombs.
- Is never found by itself in nature (it's always in a compound).

# Be 4

**Beryllium**

9.0

*from the mineral "beryl"*



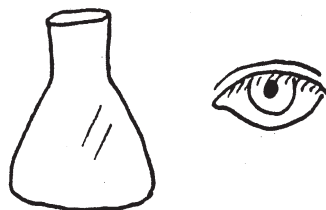
- Found in emeralds.
- Is mixed with copper to make "beryllium bronze," an alloy that will not create sparks.

# B 5

**Boron**

10.8

*from the compound "borax"*



- Used to make heat-resistant glass.
- Used to make boric acid, which is used as an antiseptic eye wash.
- Used in nuclear power plants.

# C 6

**Carbon**

12.0

*Latin: "carbo" (charcoal)*



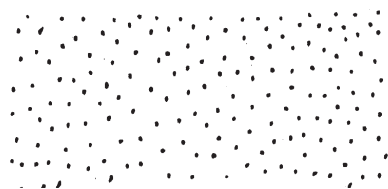
- Diamonds, graphite and coal are all made of carbon.
- Carbon makes long chains (polymers) that are the basis of fossil fuels and plastics.
- Carbon is necessary for organic molecules found in living organisms.

# N 7

**Nitrogen**

14.0

*Greek: "nitron" (the mineral saltpetre)*



- Most of the air we breathe is nitrogen.
- Used in air bags in cars.
- Doctors use liquid nitrogen to treat skin conditions.
- Proteins and DNA contain nitrogen.

# O 8

**Oxygen**

15.9

*Greek: "oxy-gen" (acid-maker)*



- Found in air, water and sand.
- Necessary for respiration and combustion.
- Ozone is made of pure oxygen.

# F 9

**Fluorine**

18.9

*Latin: "fluere" (to flow)*



- Found in the mineral fluorite.
- Is put into toothpaste to fight cavities.
- Used as a coolant.
- Used in nuclear power plants.