# Titanium

Find Titanium on your periodic table.
Note how many protons it has (that matches the atomic number).

Look at the electron configuration, if you add up those electrons, it matches the atomic number (how cool).

The ATOMIC MASS rounds to a whole number in our class.

By subtracting the number of protons from that mass, we get the number of neutrons (of the most common isotope).

Titanium is very, very tough and inflexible. Try to bend it with your fingers. It's a bit duller now, because of a thin layer of titanium oxide (which one? We don't know in our classroom, but it must be Titanium (II) or (III) or (IV)!

It's still a silvery metal (which means it's LUSTEROUS), and like most metals it can conduct heat and electricity. This metal is not as malleable compared to softer metals (it's hard to pound flat), but the general rule is that metals are malleable and ductile too (that means they can be drawn into wires).

Malleable & ductile imply a substance can shift shapes without snapping apart.

# Silver

Find Silver on your periodic table.

Silver is a “precious” metal because it does not oxidize well (react with oxygen). Iron rusts, copper turns green, titanium gets grey, silver stays sparkling silver.

Silver (and gold, platinum, palladium) hardly tarnishes, so it looks good for a long time. That’s why people think these metals are “precious” or valuable.

Silver is a transitional metal, but it only makes one type of cation. No roman numerals needed in silver compounds.

It’s a great conductor of heat and electricity too. It’s very soft and very malleable. Jewelry of silver is NOT PURE silver. Pure silver is too soft and too easily bent. It’s a great metal for wires, it conducts electricity better than copper, but it’s usually too expensive for this use.

Real “silverware” that you eat with at your grandmother’s house is not pure either. A pure silver knife would bend on a decent steak when you tried to cut the steak up!

# Silicon

Find Silicon on your periodic table.

This element is a nonmetal because it's on the right side of the stairs, but since it TOUCHES the stairs, it's also a METALLOID.

Metalloids are sometimes called semi-metals. These elements have most of the properties that you would expect (for metals or nonmetals) but have some properties from "the other side of the stairs".

For instance, silicon should not be able to conduct electricity, but it does very well. When it is melted and turned into a sheet, silicon exhibits strong luster. As a nonmetal it is still brittle (breaks when pounded) and it does not conduct heat

9 atoms touch the staircase, but 2 atoms (the dog food exception) aluminum and polonium (Al-Po) are pure metals but by exception, touch the staircase.

These 2 elements are out of place; they are exceptions to the staircase rule. There are only 7 Metalloids. You and your lab partner should write down their symbols now, and check that you each have the same 7.

# Sulfur

Find Sulfur on your periodic tables.

Note it's on the right side of the staircase, which means it's a NONMETAL. As nonmetal, sulfur is NOT malleable or ductile, instead, it is brittle. This yellow "rock" is how sulfur exists in a pure state but can easily be ground into a powder. Sulfur is NOT ductile, nor can it conduct electricity or heat.

Nonmetals make anions, nonmetals are brittle (except when they are gases), and they do not conduct heat or electricity. They are pretty much OPPOSITE the metals.

As is with all elements, the MASS is the sum of protons plus neutrons in the nucleus. You must round the mass to the nearest whole number.

The electron count matches the atomic number, and the positive protons always equal the negative electrons.

All atoms are NEUTRAL.

Touch, but don't eat the sulfur.