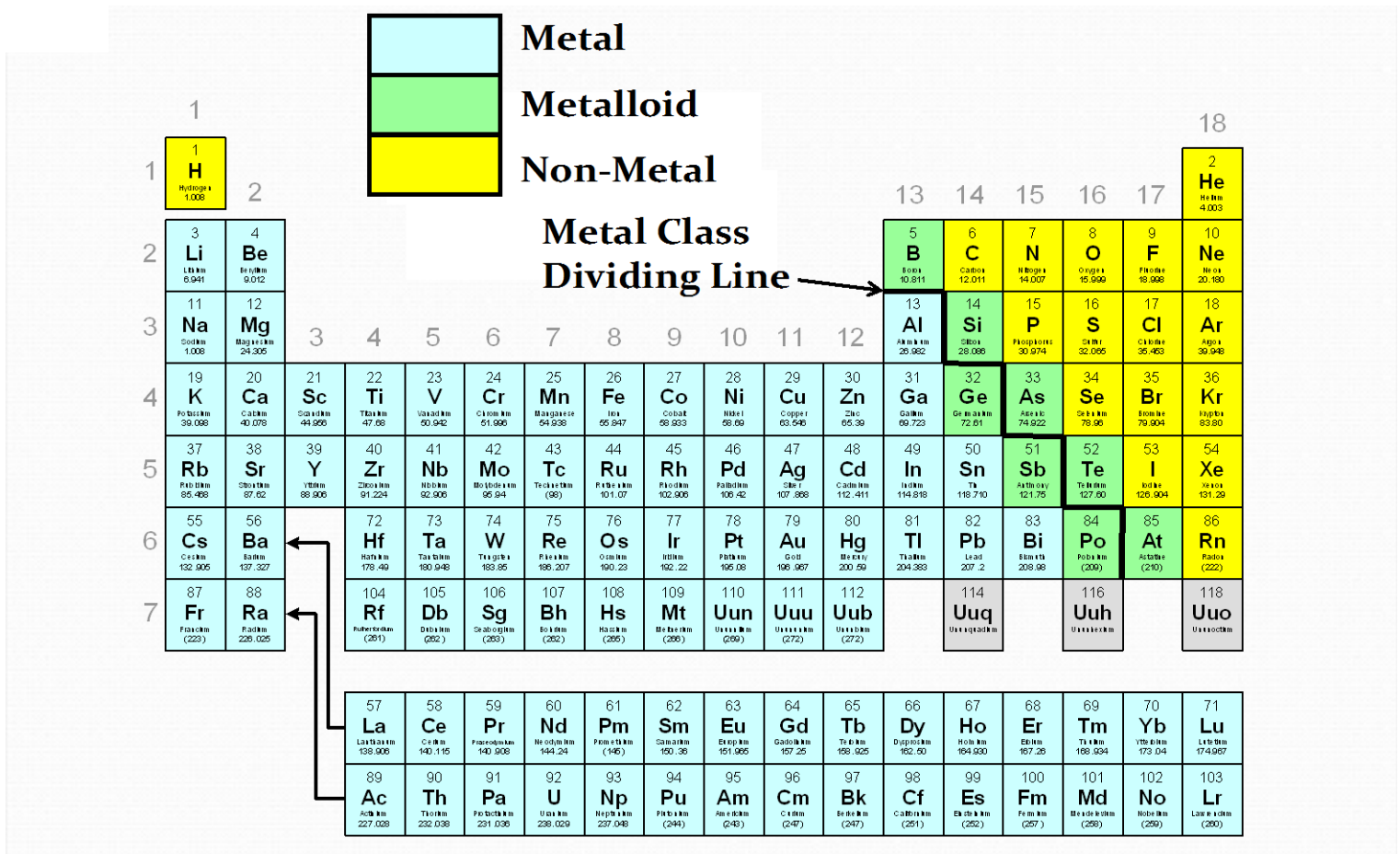


STAAR Science Tutorial 11 TEK 6.6A: Metal Classification

TEK 6.6A: Compare metals, nonmetals, and metalloids using physical properties such as luster, conductivity, or malleability.

Metal Classification

- Most versions of the periodic table include color coding for the three metal classifications for the elements: **metals**, **metalloids**, and **non-metals**. Other periodic tables, like the one used on the STAAR test, use a zigzag dividing line to show the location of the metalloids.



- Metals** occupy most of the periodic table. They are coded as blue in the textbook's periodic table. Metals generally have a "metallic" **luster**, and conduct heat and electricity well. They are usually **malleable**, meaning they can be beat into shapes (like an iron horseshoe), and **ductile**, meaning it can be drawn into a shape (like copper wire). All metals except mercury are solids at room temperature.

- **Metalloids** occupy a diagonal strip of elements between the metals on the left side of the periodic table and the non-metals on the right side, including boron, silicon, arsenic, tellurium and astatine to the right of the dividing line, and antimony, germanium and polonium to the left of the line. They are coded green in the textbook's periodic table. All metalloids are solid at room temperature. Metalloids generally have properties between the metals and non-metals. They can conduct electricity, but not as well as metals, and only under certain circumstances. Unlike metals, most metalloids are brittle, not ductile. Semi-conductors used in electronic devices are made from the metalloids silicon and germanium.
- **Non-metals** include gases like hydrogen, oxygen, nitrogen, fluorine, chlorine and the noble gases, and solids like carbon, phosphorus, sulfur, and iodine, as well as one liquid (bromine). They are coded yellow in the textbook's periodic table, and are located to the right of the metalloid dividing line (except hydrogen, at the upper left corner of the periodic table). Non-metals do not conduct heat or electricity well. When solid, they are usually **brittle**. The non-metal elements hydrogen, carbon, oxygen, nitrogen, sulfur and phosphorus are essential to life.

Practice Problems

1. Elements that conduct electricity and heat well are _____.
2. Elements that do not conduct electricity and heat well are _____.
3. Semi-conductors are often made from _____.
4. Ductile and malleable elements are _____.
5. Brittle elements are either _____ or _____.
6. Elements that have a blend of properties between metals and non-metals are _____.
7. Most of the elements essential to life are _____.
8. The elements touching the zig-zag line are _____.
9. Elements on the right side of the periodic table are _____.
10. Elements on the left side of the periodic table are _____.
11. The element sodium (Na) is a _____.
12. The element silicon (Si) is a _____.
13. The element oxygen (O) is a _____.
14. The element aluminum (Al) is a _____.
15. The element hydrogen (H) is a _____.
16. The element potassium (K) is a _____.
17. The element germanium (Ge) is a _____.