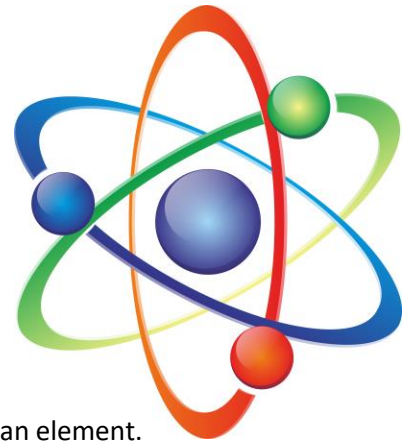


Project - 3D Atom Model



This is a project used to demonstrate your understanding of the structure of an element.

Atom Model Project Directions:

1. **Select your element.** Choose carefully. Keep in mind larger atoms will be more difficult and require more time and effort.
2. Decide which **isotope**. Most elements have several isotopes with different mass numbers.

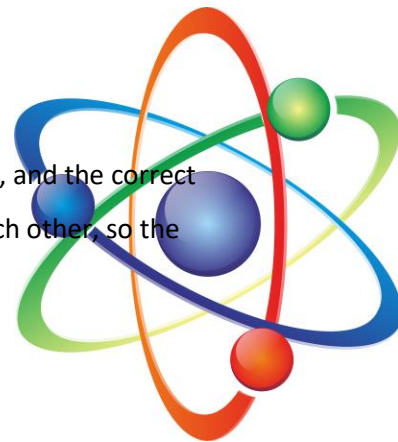
Remember, isotopes have the same number of protons and electrons, but different numbers of neutrons, so the mass numbers (protons + neutrons) of the isotopes will be different. The electron configuration (number of electrons in each energy level) of all of the isotopes will be the same.

3. **Construction of 3-Dimensional model. Requirements:**

- The 3D model needs to **hang or stand by itself**.
- You are strongly encouraged to make your model with recycled materials. It should have the correct number of protons, neutrons, and electrons. You can use cheap, easy to find materials such as wire, Styrofoam balls, or beads; no perishable food, but candy is acceptable. The electrons should be smaller than the protons and neutrons. The model should be securely put together and be colorful and attractive.
- The protons, neutrons, and electrons should be color coded, and a key should be included on the label.

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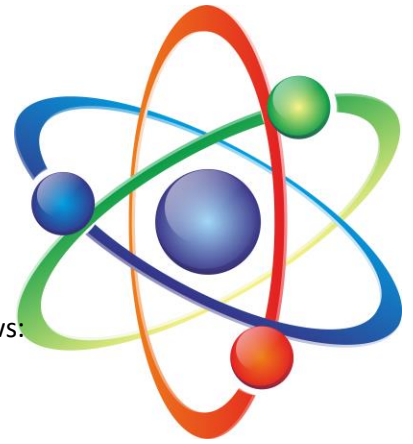
- Your model should have the correct number of energy levels, and the correct number of electrons in each energy level. Electrons repel each other, so the electrons in each energy level should be evenly distributed.
- This project is to be done outside of class.



4. Labels

Neatly label the nucleus and each energy level. Attach a label neatly written or typed that includes the following information:

- a) name, symbol, and mass number of element (e.g., Cadmium Cd 114)
- b) atomic number
- c) number of protons, neutrons and electrons
- d) electron configuration (e.g., 2, 8, 18, 18, 2 for cadmium)
- f) classification (metal, non-metal or metalloid)
- g) melting point, boiling point and density
- h) color-coded key for the protons, neutrons, and electrons



Atom Model Project Rubric

This assignment is worth a total of 60 points, which will be awarded as follows:

Scientific content 27 points

- _____ (3) Element name and symbol
- _____ (3) Atomic number (# of protons)
- _____ (3) Numbers of protons and neutrons
- _____ (3) Mass number (sum of protons and neutrons)
- _____ (3) Number of electrons
- _____ (3) Electron configuration
- _____ (3) Number of energy levels
- _____ (3) Classification (metal, non-metal, metalloid)
- _____ (3) Physical description (melting point, boiling point and density)

Workmanship 33 points

- _____ (10) Nucleus with protons and neutrons color coded with key on label, correct number of protons and neutrons in nucleus, or appearance of larger nucleus
- _____ (10) Correct number of electrons in each energy level, color coded with key on label
- _____ (10) Spatial relationships correct (nucleus in center, energy levels in different planes surrounding nucleus)
- _____ (3) Energy levels all labeled correctly

3D Atom Model is due: _____