

Grade	10-12
Unit of Study	Unit 2: The Periodic Table and The Quantum Atom
Length of Unit	3 weeks
Sample Essential Questions	Sample Corresponding Big Ideas
How is an atom's position on the periodic table a predictor of its physical and chemical properties?	Atoms in similar groups have similar electron configurations. An atom's position on the periodic table also reveals characteristics such as atomic radius and first ionization energy.
How is the quantum atom different from classical mechanics?	Electrons pop into and out of existence to create an electrostatic cloud that surrounds the nucleus. The shape of the cloud depends on the number of electrons present.

Missouri Learning Standards	
Priority Standard(s)	Supporting Standard(s)
I can explain how matter is structured, how its properties are determined by its structure, and how it changes during chemical reactions.	9-12.PS1.A.1, 9-12.PS4.B.1, 9-12.PS4.B.2
I can explain how energy is stored, transferred, and changed in physical and chemical systems.	
I can explain how waves and electromagnetic radiation transfer energy and information and interact with matter.	

Unit 2 Sequence			
MLS	Topic(s)	Learning Targets	Academic Vocabulary
PS1.A.1P S4.B.1PS 4.B.2	Periodic Trends	I can use the periodic table to describe atoms of various elements. I can use the periodic table to make predictions about physical and chemical properties.	Group Period Atomic Number Atomic Mass Protons, Neutrons, Electrons Periodic Law Atomic Radius First Ionization Energy Electronegativity
	Electron Configuration	I can explain why elements in a group share similar properties based on electron configuration. I can accurately describe the current quantum "electron cloud" model of the atom.	Orbital Subshell Energy Level Aufbau Principle Hund's Rule Pauli Exclusionary Principle

MLS	Learning Activities	
PS1.A.1P S4.B.1PS 4.B.2	Density of Germanium Lab	Must Do ▾
	Flame Test Lab	Must Do ▾
	Atomic Spectra Activity	Can Do ▾
	Phet Simulation: Atom Builder	Can Do ▾
	Periodic Table Puzzle of 1869	Can Do ▾

Assessments		
MLS	Description or Location	Rubric/Location
<i>PS1.A.1P</i> <i>S4.B.1PS</i> <i>4.B.2</i>	Unit 2 Test	Paper

Additional Resources	
Phet, OpenStax, Javalab	