

Unit 2 - R U Trendy? Atomic Structure

Content Area: **Science**
Course(s): **Chemistry Honors**
Time Period: **September**
Length: **4 weeks**
Status: **Published**

Transfer Skills

Arrangements of sub-atomic particles lead to patterns in properties and behavior of all substances

Enduring Understandings

All matter is made of atoms and the majority of the mass of an atom is in the nucleus.

Each electron has its own distinct amount of energy.

Stability of an atom is based on electron configuration.

The wavelengths, color, of emitted light are related to changes in electron's energies.

The Periodic Table is a patterned system of organized groups of related elements.

Manipulation and graphing data help to recognize and identify patterns.

Understanding of regularities and patterns in the periodic table allows for predictions of interactions among the elements.

Essential Questions

How does the structure and composition of the atom influence its chemical and physical properties?

To what extent are all atoms different and / or same?

How does the electron behave?

How and why was the periodic table developed and what is the basis of the arrangement of the elements?

How can properties of elements be predicted using the periodic table?

Content

energy level, quantum number, degenerate, electron cloud model, Auf Bau principle, Pauli Exclusion, Hunds Rule, wavelength, frequency, photon, photoelectric effect, ground state, excited state, Rydberg,

electromagnetic spectrum, Heisenberg uncertainty principle, periodic law, ionization energy, atomic radii, ion,

Skills

Explain the structure of matter Bohr's Model.

Understand the absorption and emission spectra and calculate the energy, wavelength, & frequency associated with electron movement

Write the electron configuration of elements.

List the 4 quantum numbers and describe their significant contribution to the development of quantum theory

Explain how atomic radii, ionization energy, and electron affinities vary within a group and within a period on the PT.

Predict the charge of an ion given its position on the periodic table and its electron configuration.

Resources

Standards

SCI.9-12.5.1.12.A	Students understand core concepts and principles of science and use measurement and observation tools to assist in categorizing, representing, and interpreting the natural and designed world.
SCI.9-12.5.1.12.A.1	Refine interrelationships among concepts and patterns of evidence found in different central scientific explanations.
SCI.9-12.5.1.12.A.2	Develop and use mathematical, physical, and computational tools to build evidence-based models and to pose theories.
SCI.9-12.5.1.12.A.3	Use scientific principles and theories to build and refine standards for data collection, posing controls, and presenting evidence.
SCI.9-12.5.1.12.B	Students master the conceptual, mathematical, physical, and computational tools that need to be applied when constructing and evaluating claims.
SCI.9-12.5.1.12.B.1	Design investigations, collect evidence, analyze data, and evaluate evidence to determine measures of central tendencies, causal/correlational relationships, and anomalous data.
SCI.9-12.5.1.12.B.2	Build, refine, and represent evidence-based models using mathematical, physical, and computational tools.
SCI.9-12.5.1.12.B.3	Revise predictions and explanations using evidence, and connect explanations/arguments to established scientific knowledge, models, and theories.
SCI.9-12.5.1.12.B.4	Develop quality controls to examine data sets and to examine evidence as a means of

generating and reviewing explanations.

SCI.9-12.5.1.12.C.1

Reflect on and revise understandings as new evidence emerges.

SCI.9-12.5.1.12.D.2

Represent ideas using literal representations, such as graphs, tables, journals, concept maps, and diagrams.

SCI.9-12.5.1.12.D.3

Demonstrate how to use scientific tools and instruments and knowledge of how to handle animals with respect for their safety and welfare.

SCI.9-12.5.2.12.A.3

Predict the placement of unknown elements on the Periodic Table based on their physical and chemical properties.

TECH.8.1.12.A.1

Create a personal digital portfolio which reflects personal and academic interests, achievements, and career aspirations by using a variety of digital tools and resources.

TECH.8.1.12.A.4

Construct a spreadsheet workbook with multiple worksheets, rename tabs to reflect the data on the worksheet, and use mathematical or logical functions, charts and data from all worksheets to convey the results.