2020 Unit 1: Introduction to Environmental and Chemistry

Content Area: **Science**
Course(s): **Environmental Science**
Time Period: **September**
Length: **30 Instructional Days**
Status: **Published**

Enduring Understandings:

- An atom's nucleus is made of protons and neutrons and is surrounded by electrons.
- Each atom has a charged substructure.
- The periodic table orders elements horizontally by number of protons in the nucleus of each element's atoms and places elements with similar chemical properties in columns.
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- The structure and interactions of matter at the bulk scale are determined by electrical forces within and between atoms.

Essential Questions:

- How does the atom's structure indicate its characteristics?
- How does the forces of an atom determine its basic structure and function?
- What is the significance of the structure of an atom?

Lesson Titles:

- Basic Atomic Structure
- Phases of Matter
- Scientific Measurement
- Scientific Process

Career Readiness, Life Literacies & Key Skills

WRK.K-12.P.1	Act as a responsible and contributing community members and employee.
WRK.K-12.P.4	Demonstrate creativity and innovation.
WRK.K-12.P.5	Utilize critical thinking to make sense of problems and persevere in solving them.
WRK.K-12.P.8	Use technology to enhance productivity increase collaboration and communicate effectively.
WRK.K-12.P.9	Work productively in teams while using cultural/global competence.

Inter-Disciplinary Connections:

LA.RL.9-10.1	Cite strong and thorough textual evidence and make relevant connections to support analysis of what the text says explicitly as well as inferentially, including determining where the text leaves matters uncertain.
MA.A-SSE.A.1a	Interpret parts of an expression, such as terms, factors, and coefficients.
LA.RH.9-10.2	Determine the theme, central ideas, key information and/or perspective(s) presented in a primary or secondary source; provide an accurate summary that makes clear the relationships among the key details and ideas.
LA.RL.9-10.2	Determine a theme or central idea of a text and analyze in detail its development over the course of the text, including how it emerges and is shaped and refined by specific details and provide an objective summary of the text.
LA.RL.9-10.4	Determine the meaning of words and phrases as they are used in the text, including figurative and connotative meanings; analyze the cumulative impact of specific word choices on meaning and tone (e.g., how the language evokes a sense of time and place; how it sets a formal or informal tone).
LA.RH.9-10.7	Integrate quantitative or technical analysis (e.g., charts, research data) with qualitative analysis in print or digital text, to analyze information presented via different mediums.
MA.A-REI.A	Understand solving equations as a process of reasoning and explain the reasoning
MA.A-REI.C	Solve systems of equations
MA.A-REI.D.10	Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).
SOC.9-12.1.1.1	Compare present and past events to evaluate the consequences of past decisions and to apply lessons learned.
SOC.9-12.1.1.2	Analyze how change occurs through time due to shifting values and beliefs as well as technological advancements and changes in the political and economic landscape.

Instructional Strategies, Learning Activities, and Levels of Blooms/DOK:

- Answering questions on topical current event articles
- Chromebook activity on metric measurement
- Chromebook activity on structure of an atom
- Class Discussion
- Metric Measurement Lab
- Metric measurement worksheet
- Mystery box/bag Lab
- Notetaking of vocabulary and contextual information
- Pendulum Lab
- Worksheet on atom structure
- Worksheet on detecting bias
- Worksheet on phases of matter
- Worksheet on the scientific process

Modifications

Benchmark Assessments

Skills-based assessment

Reading response

Writing prompt

Lab practical

Formative Assessment:

- Anticipatory Set
- Closure
- Lab Reports States of Matter
- Observe patterns in the outermost electron states of atoms, trends in the periodic table, and chemical properties.
- Plan and conduct an investigation individually and collaboratively to produce data that can serve as the basis for evidence for comparing the structure of substances at the bulk scale to infer the strength of electrical forces between particles.
- Use the periodic table as a model to provide evidence for relative properties of elements at different scales based on the patterns of electrons in the outermost energy level of atoms in main group elements.
- Warm-Up

Summative Assessment:

- Lab Practical, lab safety, Technique and Measurement
- Marking Period 1 Assessment on Unit 1 and 2
- Project on Current Environmental Issues
- Unit 1 Assessment on Bias, Intro to Chem, Sci Method

Alternative Assessments

Performance tasks

Project-based assignments

Problem-based assignments

Presentations

Reflective pieces

Concept maps

Case-based scenarios

Portfolios

Resources & Materials:

- Ball and Stick Models
- Goggles
- Hot Plates
- http://tinyurl.com/preucs2
- http://www.rsc.org/education/teachers/resources/periodictable/pre16/develop/mendeleev.htm
- https://www.khanacademy.org/science/chemistry/electronic-structure-of-atoms/history-of-atomic-structure/a/daltons-atomic-theory-version-2
- Metric Measurement Tools; objects
- Pyrex Glass Instruments