

| Day       | Objectives, Standards & Essential Questions  | Assignments (all work still posted on Dr. Thornton JERFSA):<br><a href="https://sites.google.com/palmbeachschools.org/drthorntonjerfsa/home?authuser=2">https://sites.google.com/palmbeachschools.org/drthorntonjerfsa/home?authuser=2</a> <b>CHECK CLASSROOM FOR DEADLINES</b>  | Due Date<br><b>9.15-9.19</b>  |
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| Monday    | <b>OBJ:</b><br><b>EQ: OBJ:</b> Explore the scientific theory of atoms (also known as atomic theory) by describing the structure of atoms in terms of protons, neutrons and electrons, and differentiate among these particles in terms of their mass, electrical charges and locations within the atom.<br><br><b>SC.912.P.8.4</b> | <b>CLASS:</b> Discuss Superhero Project Unit 2, Activities #13 <ul style="list-style-type: none"> <li>Column and row Periodic Table notes COMPLETE Unit 2, Section I LESSONS, #5 ATOMS AND PERIODIC TABLE</li> <li>Complete ANSWER QUESTIONS on PGS Pgs 77-87-Unit 2 Activity #6</li> </ul> <b>HOMEWORK:</b> Complete Periodic Table (MAKE A LEGEND)   | <i>Homework Due at Beginning of Class on DUE DATE NOTED IN GOOGLE CLASSROOM</i> |
| Tuesday   |  | <b>ENVIROSERVICE<br/>NO CLASS</b>  |   |
| Wednesday |  | <b>CLASS:</b> <ul style="list-style-type: none"> <li>Begin Super hero Project Unit 2, Activities #12</li> <li>Checking in class- periodic table</li> </ul> <b>HOMEWORK:</b> <ul style="list-style-type: none"> <li>Unit 2, III Homework, Atomic # worksheet #6</li> </ul>  |   |
| Thursday  |  | <b>CLASS:</b> Super Hero Project Questions <ul style="list-style-type: none"> <li>REVIEW NOTES FOR INDEPENDENT PROJECT</li> </ul> <b>HOMEWORK:</b> <ul style="list-style-type: none"> <li>CHECK FOR NEWSELA</li> <li>Classification of Matter PPT Lesson #9</li> <li>Classification of Matter PPT: FOLDABLE (directions in PPT) BEGIN States of Matter Trifold! Use ppt, Unit 2, Lessons #9               <ul style="list-style-type: none"> <li>SLIDE # 1 breaks down foldable "pages"</li> </ul> </li> </ul> <b>HOMEWORK:</b> WORK ON SUPER HERO PROJECT |   |

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| Friday |  | <b>CLASS:</b> <ul style="list-style-type: none"><li>• Complete FOLDABLE MATTER</li><li>• Work on Periodic Table Super Hero</li></ul> <b>HOMEWORK:</b> <ul style="list-style-type: none"><li>• WORK ON SUPER HERO PROJECT</li></ul> |  |
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SC.912.P.8.3 . Explore the scientific theory of atoms (also known as atomic theory) by describing changes in the atomic model over time and why those changes were necessitated by experimental evidence.

Cognitive Complexity Rating: Level 3: Strategic Thinking and Complex Reasoning Strand

Chemistry Prior Grade(s): Science Connection

SC.912.P.8.1Explore the scientific theory of atoms (also known as atomic theory) by using models to explain the motion of particles in solids, liquids, and gases.

SC.912.P.8.7 Explore the scientific theory of atoms (also known as atomic theory) by recognizing that atoms are the smallest unit of an element and are composed of subatomic particles (electrons surrounding a nucleus containing protons and neutrons).

FCAT . Big Idea . Matter . Benchmark

Explore the scientific theory of atoms (also known as atomic theory) by describing changes in the atomic model over time and why those changes were necessitated by experimental evidence.

Content Limits

8.3- Describe the development and historical importance of atomic theory from Dalton (atomic theory), Thomson (the electron), Rutherford (the nucleus and “ gold foil experiment), and Bohr (planetary model of atom), and understand how each discovery leads to modern atomic theory.

Florida Standards Connections

MAFS.K12.MP.4: Model with mathematics

Access PointsIndependentSC.912.P.8.In.3: Identify the nucleus as the center of an atom.

SupportedSC.912.P.8.Su.3: Recognize that atoms are tiny particles in materials, too small to see.

ParticipatorySC.912.P.8.Pa.3: Recognize that the parts of an object can be put together to make a whole.

ScienceSC.912.P.8.5

Relate properties of atoms and their position in the periodic table to the arrangement of their electrons.

Cognitive Complexity Rating Level 2: Basic Application of Skills and ConceptsStrandChemistryPrior

Grade(s): Science ConnectionSC.8.P.8.4Classify and compare substances on the basis of characteristic physical properties that can be demonstrated or measured for example, density, thermal or electrical conductivity, solubility, magnetic properties, melting and boiling points, and know that these properties are independent of the amount of the sample.

SC.8.P.8.5Recognize that there are a finite number of elements and that their atoms combine in a multitude of ways to produce compounds that make up all of the living and nonliving things that we encounter.

SC.8.P.8.6Recognize that elements are grouped in the periodic table according to similarities of their properties.

FCATBig Idea:MatterBenchmark:Relate properties of atoms and their position in the periodic table to the arrangement of their electrons.

Content Limits:8.5- Use the periodic table and electron configuration to determine an elements number of valence electrons and its chemical and physical properties. Explain how chemical properties depend almost entirely on the configuration of the outer electron shell.



## Key Concepts

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An atom is the smallest unit of an element that maintains all the chemical and physical properties of that element. Atoms are made up of subatomic particles called protons, neutrons, and electrons.

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Protons and neutrons are located in the nucleus of an atom. These tiny subatomic protons and neutrons have nearly identical masses, and their combined mass determines the mass of the atom.

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Electrons are located outside the nucleus of an atom, in an area called the electron cloud. Since the electron cloud takes up space, electrons contribute to the volume of an atom. However, as electrons are so small, their presence does not significantly change the mass of the atom.

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Protons have a positive electrical charge, and electrons have a negative electrical charge. Neutrons have no electrical charge. When an atom has the same number of protons and electrons, the electrical charges cancel out, so the atom, as a whole, does not have an electrical charge.



## Fundamental Questions

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What makes up an atom?

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What is the difference between the sizes in the subatomic particles?

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Where are protons, neutrons, and electrons located in the atom?

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What are the charges of protons, neutrons, and electrons?

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| <b>Unit Goal:</b> Through inquiry and exploration, students will understand the structure and composition of the atom as well as how energy is absorbed and released at the atomic and subatomic level. | <b>Suggested Time Frame:</b> 22 days (9/16 -10/17)   |
| <b>Text Resources:</b> Pages 87-146; for specific resources related to Nature of Science Benchmarks, please see the "Nature of Science" tab in "Teacher Toolbox: Secondary"                             | <b>Lesson Plans:</b> See Lesson Plan Link in Blender |

| Content/Academic Language |   |   |  |                                      |   |                       |                                  |
|---------------------------|---|---|--|--------------------------------------|---|-----------------------|----------------------------------|
| <b>FLDOE</b>              | amplitude<br>atom<br>electromagnetic spectrum<br>electron | fission<br>frequency<br>fusion<br>gravity | infrared<br>light<br>mass<br>microwave | mole<br>neutron<br>nucleus<br>proton | radiation<br>radioactivity<br>theory<br>ultraviolet | wavelength<br>x-ray   |                                  |
| <b>Other</b>              | atomic mass<br>atomic number                              | chemical<br>reaction decay                | electron configuration<br>model        | magnitude<br>orbital                 | phenomena<br>photon                                 | quantization<br>range | strong nuclear*<br>weak nuclear* |

| Next Generation Sunshine State Standards  | Complexity Level | Student Target  |
|---|------------------|---|
| <b>Topic 1: Atomic Theory</b>   |                  |   |
| SC.912.P.8.3 Explore the scientific theory of atoms (also known as atomic theory) by describing changes in the atomic model over time and why those changes were necessitated by experimental evidence.   | High             | <ul style="list-style-type: none"> <li>analyze and differentiate among the theories and associated scientists that led to the modern atomic theory.</li> <li>explain how observations made during experimentation (like Thomson's cathode ray tube experiment and Rutherford's gold-foil experiment) led to the modification of the atomic model the discovery of the particles that make up the atom</li> </ul>  |
| SC.912.P.8.4 Explore the scientific theory of atoms (also known as atomic theory) by describing the structure of atoms in terms of protons, neutrons and electrons, and differentiate among these particles in terms of their mass, electrical charges and locations within the atom. | High             | <ul style="list-style-type: none"> <li>differentiate among identification, description, location, mass, and electrical charges of subatomic particles.</li> <li>identify the number of atomic orbitals, electrons, neutrons, protons, and the location of each subatomic particle for a given atom.</li> <li>explain that electrons, protons and neutrons are parts of the atom and that the nuclei of atoms are composed of protons and neutrons, which experience forces of attraction and repulsion consistent with their charges and masses.</li> <li>explain how isotopes of an element differ.</li> </ul> |
| **SC.912.P.10.10 Compare the magnitude and range of the four fundamental forces (gravitational, electromagnetic, weak nuclear, strong nuclear).   | Moderate         | <ul style="list-style-type: none"> <li>understand that nuclear forces are responsible for the structure and make-up of the atom.</li> </ul>   |
| **SC.912.N.3.1 Explain that a scientific theory is the culmination of many scientific investigations drawing together all the current evidence concerning a substantial range of phenomena; thus, a scientific theory represents the most powerful explanation scientists             | High             | <ul style="list-style-type: none"> <li>explain that a scientific theory is a well-tested hypothesis supported by a preponderance of empirical evidence.</li> <li>explain how the development of the atomic theory was modified with the addition of new information.</li> </ul>   |

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| have to offer.   |          |  |
| SC.912.P.10.9 Describe the quantization of energy at the atomic level.   | Moderate | <ul style="list-style-type: none"> <li>explain what the quantum mechanical model determines about the electrons in an atom.</li> <li>summarize the relationship between energy and frequency.</li> <li>predict the behavior of and/or calculate quantum and photon energy from frequency.</li> <li>explain that when electrons transition to higher energy levels they absorb energy, and when they transition to lower energy levels they emit energy.</li> <li>recognize that spectral lines are the result of transitions of electrons between energy levels that correspond to photons of light with an energy and frequency related to the energy spacing between levels (Planck's relationship: <math>E = h\nu</math>).</li> </ul> |
| SC.912.P.10.18 Explore the theory of electromagnetism by comparing and contrasting the different parts of the electromagnetic spectrum in terms of wavelength, frequency, and energy, and relate them to phenomena and applications. | High     | <ul style="list-style-type: none"> <li>explain how the frequencies of emitted light are related to changes in electron energies.</li> <li>describe the electromagnetic spectrum (i.e., radio waves, microwaves, infrared, visible light, ultraviolet, X-rays and gamma rays) in terms of frequency, wavelength and energy.</li> <li>solve problems involving wavelength, frequency, and energy.</li> <li>explain how the quantization of energy of an atom relates to the electromagnetic (EM) spectrum.</li> </ul>  |
| SC.912.N.3.2 Describe the role consensus plays in the historical   |          | <ul style="list-style-type: none"> <li>recognize that scientific argument, disagreement, discourse, and discussion create a broader and more accurate understanding of natural processes/events.</li> </ul>  |

Class: HONORS CHEM P2 & P 3

Teacher Name: THORNTON