

TCSS Physical Science

Unit 3 – Chemical Bonding Information

Milestones Domain/Weight: Atomic and Nuclear Theory and the Periodic Table 25%
Chemical Reactions and Properties of Matter 25%

Georgia Performance Standards:

SPS1. Students will investigate our current understanding of the atom.

b. Compare and contrast ionic and covalent bonds in terms of electron movement.

SPS2. Students will explore the nature of matter, its classifications, and its system for naming types of matter.

b. Predict formulas for stable binary ionic compounds based on balance of charges.

c. Use IUPAC nomenclature for transition between chemical names and chemical formulas of: binary ionic compounds, binary covalent compounds (i.e. carbon dioxide, carbon tetrachloride).

Purpose/Goal(s):

- Students will understand how electrons are involved in ionic and covalent bonding.
- Students will be able to predict formulas for stable binary ionic compounds based on balance of charges.
- Students will be able to transition between chemical names and chemical formulas of binary ionic compounds and binary covalent compounds.

Content Map: [Unit 3 – Chemical Bonding Content Map](#)

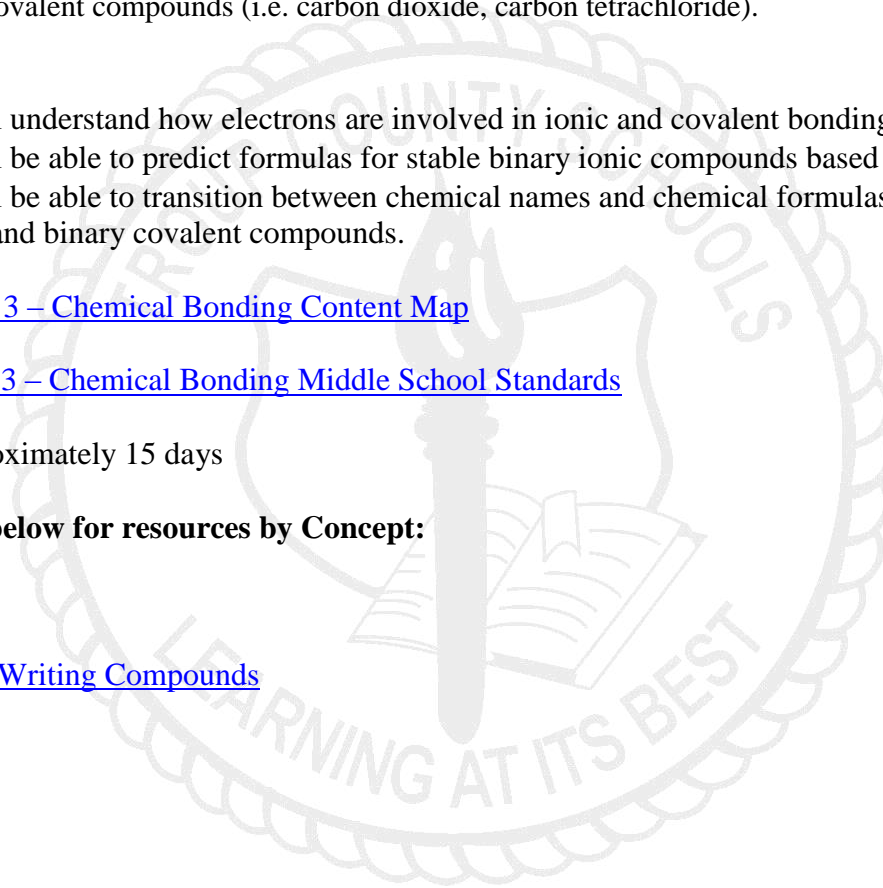
Prerequisites: [Unit 3 – Chemical Bonding Middle School Standards](#)

Unit Length: Approximately 15 days

Click on the links below for resources by Concept:

[Concept 1: Bonding](#)

[Concept 2: Naming/Writing Compounds](#)



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Concept, Essential Question(s), and Standard(s)	Vocabulary	Resources [Back to Top]	Assessment
<p><u>Concept 1:</u> Bonding</p> <p><u>EQ1:</u> How does atomic structure relate to bonding patterns?</p> <p><u>EQ2:</u> Why do some atoms gain electrons while others lose them in chemical reactions?</p> <p><u>EQ3:</u> If an atom loses an electron, why would the resulting particle have a positive charge?</p> <p><u>EQ4:</u> What is the difference between covalent and ionic bonds?</p> <p><u>SPS1b.</u> Compare and contrast ionic and covalent bonds in terms of electron movement.</p>	<p><u>Essential*</u></p> <p>Covalent Bonds Ionic Bonds</p> <p><u>Supplemental**</u></p> <p>Anion Cation Ion Valence Electrons</p> <p>*Essential vocabulary listed in the GPS Standards</p> <p>**Supplemental vocabulary listed in the state frameworks and/or other state document</p>	<p><u>Animations/Videos</u></p> <p>Chemical Bonding – Ionic vs. Covalent Bonds (2:13) – Describes the Octet Rule and explains the difference between ionic and covalent bonds</p> <p><u>Notes</u></p> <p>Bonding – PowerPoint with notes for bonding</p> <p><u>Worksheets/Practice</u></p> <p>Bonding Graphic Organizer – Word document to accompany the Bonding PPT with practice questions on the back</p> <p><u>Other Resources</u></p> <p>Chemical Bonding – Website with information about chemical bonding and relationships. The website also includes a quiz and links to other resources.</p>	<p>Concept 1: Sample Assessment Items</p>

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<p><u>Concept 2:</u> Naming/Writing Compounds</p> <p><u>EQ1:</u> Why do scientists need a system for naming and writing compounds?</p> <p><u>EQ2:</u> How do we name binary, ionic and covalent compounds?</p> <p><u>EQ3:</u> How do we write the formula for binary, ionic and covalent compounds?</p> <p><u>SPS2b.</u> Predict formulas for stable binary ionic compounds based on balance of charges.</p> <p><u>SPS2c.</u> Use IUPAC nomenclature for transition between chemical names and chemical formulas of: binary ionic compounds, binary covalent compounds (i.e. carbon dioxide, carbon tetrachloride).</p>	<p><u>Essential*</u> Binary Compound Chemical Formula IUPAC Nomenclature</p> <p><u>Supplemental**</u></p> <p>*Essential vocabulary listed in the GPS Standards</p> <p>**Supplemental vocabulary listed in the state frameworks and/or other state document</p>	<p><u>Animations/Videos</u> PhET Sugar and Salt Solutions – Simulation that can be used to represent the difference between ionic and covalent bonds. Introduction to Ionic & Covalent Bonding – Activity to accompany the PhET Lab above.</p> <p><u>Notes</u> Naming & Writing Compounds – PowerPoint which describes how to name ionic and covalent bonds and write formulas from names. The PowerPoint also includes examples of naming and writing compounds for ionic and covalent. Compound Guide for Names and Formulas – Word document to accompany the Naming & Writing Compounds PowerPoint.</p> <p><u>Practice/Worksheets</u> Ionic Compounds Tile Activity – Activity with tiles the students can cut and paste to practice balancing charges and forming compounds. Binary Ionic Compounds Naming and Writing – Practice transitioning between formulas and names. Ionic Compounds True/False – Activity where the students look at multiple ionic compounds and determine if they are named or written correctly. Compounds Differentiated Activity – Differentiated activity (two levels) for forming and naming compounds.</p> <p><u>Other Resources</u> Blank Periodic Table Tiles – Document with periodic table tiles which can be printed on colored card stock and posted on a wall for students to reference.</p>	<p>Concept 2: Sample Assessment Items</p>