# *ChemMatters* Magazine December 2019

# Chemistry Concepts & Standard Alignments (NGSS, CCSS)

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**Correlations to Next Generation Science Standards**

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| Article | Chemistry Concepts | NGSS Connections |
| [*Vaping: What You Need to Know*](https://www.acs.org/content/acs/en/education/resources/highschool/chemmatters/past-issues/2019-2020/dec-2019/vaping.html) | Acids and Bases  Acid-base reactions  Organic Chemistry  Functional groups  Pharmaceuticals  States of Matter | **HS-PS2-6**  Communicate scientific and technical information about why the molecular-level structure is important in the functioning of designed materials.    **Disciplinary Core Ideas:**   * PS1.A: Structure and Properties of Matter   **Crosscutting Concepts:**   * Cause and Effect: Mechanism and explanation. * Scale, Proportion, and Quantity * Structure and Function   **Science and Engineering Practices:**   * Asking questions (for science) and defining problems (for engineering)   **Nature of Science:**   * Scientific knowledge is based on empirical evidence. * Science addresses questions about the natural and material world |
| *The Battle Against Body Odor* | Molecules & Bonding  Intermolecular forces  Organic Chemistry  Molecular structure  Quantitative Chemistry  SI Units | **HS-PS2-6**. Communicate scientific and technical information about why the molecular-level structure is important in the functioning of designed materials.  **HS-ETS1-3**  Evaluate a solution to a complex real-world problem based on prioritized criteria and tradeoffs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts.    **Disciplinary Core Ideas:**   * PS1.A: Structure and Properties of Matter * ETS1.B: Developing Possible Solutions   **Crosscutting Concepts:**   * Scale, Proportion, and Quantity * Structure and Function   **Science and Engineering Practices:**   * Constructing explanations and designing solutions * Asking questions (for science) and defining problems (for engineering)   **Nature of Science:**   * Science is a human endeavor. * Science addresses questions about the natural and material world |
| *When Winter is Too Cold* | Chemistry Basics  Physical properties  States of Matter  Gases | **HS-ESS-5**  Analyze geoscience data and the results from global climate models to make an evidence-based forecast of the current rate of global or regional climate change and associated future impacts to Earth’s systems.  **Disciplinary Core Ideas**:   * ESS2.D: Weather and Climate   **Crosscutting Concepts:**   * Patterns * Cause and Effect: Mechanism and explanation * Systems and system models   **Science and Engineering Practices:**   * Analyzing and interpreting data * Constructing explanations (for science) and designing solutions (for engineering) * Engaging in argument from evidence   **Nature of Science:**   * Scientific knowledge is based on empirical evidence. * Scientific knowledge assumes an order and consistency in natural systems |
| *The Great Molasses Flood* | Chemistry basics - Fermentation  Gases – Pressure  Kinetics – Catalysts  Molecules & Bonding  Intermolecular forces  Polarity  Isomers  Molecular structure  Solutions | **HS-PS2-6**.  Communicate scientific and technical information about why the molecular-level structure is important in the functioning of designed materials.  **HS-ETS1-3.**  Evaluate a solution to a complex real-world problem based on prioritized criteria and tradeoffs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts.  **Disciplinary Core Ideas**:   * PS1.A: Structure and Properties of Matter * ETS1.C: Optimizing the design solution   **Crosscutting Concepts:**   * Cause and Effect: Mechanism and explanation * Structure and Function   **Science and Engineering Practices:**   * Analyzing and interpreting data * Constructing explanations (for science) and designing solutions (for engineering)   **Nature of Science:**   * Scientific knowledge is based on empirical evidence. * Scientific knowledge assumes an order and consistency in natural systems |

**Correlations to Common Core State Standards**

***Note:*** ELA-Literacy **Common Core State Standards** Connections for all articles

* **ELA-Literacy.RST.9-10.1:** Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.
* **ELA-Literacy.RST.9-10.2:** Determine the central ideas or conclusions of a text; trace the text's explanation or depiction of a complex process, phenomenon, or concept; provide an accurate summary of the text.
* **ELA-Literacy.RST.9-10.5**: Analyze the structure of the relationships among concepts in a text, including relationships among key terms (e.g., force, friction, reaction force, energy).
* **ELA-Literacy.RST.9-10.8**: Assess the extent to which the reasoning and evidence in a text support the author's claim or a recommendation for solving a scientific or technical problem.
* **ELA-Literacy.RST.11-12.1**:Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account.
* **ELA-Literacy. RST.11-12.2:** Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.
* **ELA-Literacy. RST.11-12.4:** Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11-12 texts and topics.
* **ELA-Literacy.RST.11-12.6**: Analyze the author's purpose in providing an explanation, describing a procedure, or discussing an experiment in a text, identifying important issues that remain unresolved.

***In addition***, the teacher could assign writing to include the following **Common Core State Standards**:

* **ELA-Literacy.WHST.9-10.2:** Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes.
* **ELA-Literacy.WHST.9-10.2F**: Provide a concluding statement or section that follows from and supports the information or explanation presented (e.g., articulating implications or the significance of the topic).
* **ELA-Literacy.WHST.11-12.2:**  Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes.
* **ELA-Literacy.WHST.11-12.2E:** Provide a concluding statement or section that follows from or supports the argument presented.