# *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 BasesAcid-base reactionsOrganic ChemistryFunctional groupsPharmaceuticalsStates 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
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| *The Battle Against Body Odor*  | Molecules & BondingIntermolecular forcesOrganic ChemistryMolecular structureQuantitative ChemistrySI 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
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| *When Winter is Too Cold* | Chemistry BasicsPhysical propertiesStates of MatterGases | **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
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| *The Great Molasses Flood* | Chemistry basics - FermentationGases – PressureKinetics – CatalystsMolecules & BondingIntermolecular forcesPolarityIsomersMolecular structureSolutions | **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
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**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.