# *ChemMatters* Magazine October 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 |
| [*The Secret Life of Gold*](https://www.acs.org/content/acs/en/education/resources/highschool/chemmatters/past-issues/2019-2020/october-2019/secrets-of-gold.html) | Nuclear Chemistry  Atomic Structure  Model of the atom  Subatomic particles | **HS-PS1-8**  Develop models to illustrate the changes in the composition of the nucleus of the atom and the energy released during the processes of fission, fusion, and radioactive decay.    **Disciplinary Core Ideas:**   * PS1.A: Structure and Properties of Matter * PS1.C: Nuclear Processes   **Crosscutting Concepts:**   * Scale, Proportion, and Quantity * Energy and Matter * Stability and Change   **Science and Engineering Practices:**   * Developing and using models * Asking questions (for science) and defining problems (for engineering)   **Nature of Science:**   * Science models, laws, mechanisms, and theories explain natural phenomena. * Science addresses questions about the natural and material world |
| *Cash, Chemistry, and Counterfeit* | Chemistry Basics  Chemical and physical changes  Chemical and physical properties  Atomic Structure  Emission spectrum | **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:**   * Patterns * Structure and Function * Stability and Change   **Science and Engineering Practices:**   * Analyzing and interpreting data * Constructing explanations (for science) and designing solutions (for engineering)   **Nature of Science:**   * Scientific investigations use a variety of methods. * Scientific knowledge assumes an order and consistency in natural systems. * Science is a human endeavor |
| *The Measure of a Mole* | Chemistry Basics  Accuracy  Physical properties  Quantitative Chemistry  Mole concept  Measurement  SI units | **HS-PS1-8**  Develop models to illustrate the changes in the composition of the nucleus of the atom and the energy released during the processes of fission, fusion, and radioactive decay.  **Disciplinary Core Ideas:**   * PS1.A: Structure and Properties of Matter * PS1.C: Nuclear Processes   **Crosscutting Concepts:**   * Scale, Proportion, and Quantity * Energy and Matter * Stability and Change   **Science and Engineering Practices:**   * Developing and using models * Asking questions (for science) and defining problems (for engineering)   **Nature of Science:**   * Science models, laws, mechanisms, and theories explain natural phenomena. * Science addresses questions about the natural and material world |
| *The Future of Forensics* | Molecules and bonding  Molecular structure  Instrumentation | **HS-PS1-3.**  Plan and conduct an investigation to gather evidence to compare the structure of substances at the bulk scale to infer the strength of electrical forces between particles.  **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 * PS2.B: Types of Interactions * ETS1.C: Optimizing the Design Solution   **Crosscutting Concepts:**   * Patterns * Cause and Effect * Structure and Function * Stability and Change   **Science and Engineering Practices:**   * Planning and carrying out investigations * Engaging in argument from evidence * Obtaining, evaluating, and communication information   **Nature of Science:** Scientific knowledge is based on empirical evidence. |

**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.