# *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 ChemistryAtomic StructureModel of the atomSubatomic 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
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| *Cash, Chemistry, and Counterfeit* | Chemistry BasicsChemical and physical changesChemical and physical propertiesAtomic StructureEmission 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
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| *The Measure of a Mole* | Chemistry BasicsAccuracyPhysical propertiesQuantitative ChemistryMole conceptMeasurementSI 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
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| *The Future of Forensics* | Molecules and bondingMolecular structureInstrumentation | **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.