

Chemistry

| Standards | <p style="text-align: center;">Not Proficient</p> <p>Students who perform at this level have not demonstrated mastery in academic performance, thinking abilities, and application of understandings that reflect the knowledge and skills specified by the grade/course level content standards and are not prepared for the next level of study.</p> | <p style="text-align: center;">Approaching Proficient</p> <p>Students who perform at this level demonstrate partial mastery in academic performance, thinking abilities, and application of understandings that reflect the knowledge and skills specified by the grade/course level content standards and are minimally prepared for the next level of study.</p> | <p style="text-align: center;">* Proficient</p> <p>Students who perform at this level demonstrate mastery in academic performance, thinking abilities, and application of understandings that reflect the knowledge and skills specified by the grade/course level content standards and are well prepared for the next level of study.</p> | <p style="text-align: center;">Advanced</p> <p>Students who perform at this level demonstrate superior mastery in academic performance, thinking abilities, and application of understandings that reflect the knowledge and skills specified by the grade/course level content standards and are significantly prepared for the next level of study.</p> |
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| Embedded Inquiry | NOTE: embedded standards are taught and assessed as components that are integrated into the science content at each grade level or course. | | | |
| Embedded Technology and Engineering | NOTE: embedded standards are taught and assessed as components that are integrated into the science content at each grade level or course. | | | |
| Embedded Mathematics | NOTE: embedded standards are taught and assessed as components that are integrated into the science content at each grade level or course. | | | |

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| 1.0 Atomic Structure | <p>A student at this level has not demonstrated a basic understanding of the principles associated with the Chemistry topic of Atomic Structure.</p> | <p>A student at this level can use the periodic table to describe an elements' atomic structure and resulting chemical properties. He/she can describe various models of the atom in the correct historical sequence. The student can describe isotopes, ions, and the energy of electrons. The student can recognize why the properties of an element make it useful for various technological applications.</p> | <p>A student at this level can use the periodic table to compare the atomic structure and chemical properties of different elements. He/she can describe the experimental evidence that led to the development of different atomic models over time. The student can apply mathematical principles to understand isotopes, ions, and the energy of electrons. The student can apply the engineering design cycle to describe the connection between the properties of an element and its use by humans.</p> | <p>A student at this level can apply the periodic table to predict an elements' atomic structures and resulting chemical properties. He/she can evaluate the strengths and weakness of different models that have been used to describe the structure of an atom. He/she can describe the latest subatomic particles to have been identified. The student applies advanced mathematical operations to describe the characteristics of isotopes, ions, and the energy of electrons. The student can apply the engineering design cycle to predict potential uses for an element based on the properties of its atoms.</p> |
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| 2.0 Matter and Energy | <p>A student at this level has not demonstrated a basic understanding of the principles associated with the Chemistry topic of Matter and Energy.</p> | <p>A student at this level can use appropriate tools and techniques to explore the properties of matter and the interactions between matter and energy. He/she can translate data into a table or graph to draw a simple conclusion. The student can apply given mathematical equations to study the properties of matter and the interactions between matter and energy.</p> | <p>A student at this level can select appropriate tools and techniques to investigate the properties of matter and the interactions between matter and energy. He/she can apply qualitative and quantitative techniques to analyze data, interpolate between data points in a graph, and draw accurate conclusions. The student can select the appropriate mathematical equations used to study a particular property of matter and the interactions between matter and energy.</p> | <p>A student at this level can design and conduct complex investigations of the properties of matter and the interactions between matter and energy using appropriate tools and techniques. He/she can modify experimental conditions to produce different results. He/she can select appropriate qualitative and quantitative measures to analyze data, interpolate between and extrapolate from data points in a graph, and draw accurate conclusions. The student can apply complex mathematical equations to study the properties of matter and the interactions between matter and energy.</p> |
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3.0 Interactions of Matter

A student at this level has not demonstrated a basic understanding of the principles associated with the Chemistry topic of Interaction of Matter.

A student at this level demonstrates an understanding of the law of conservation of matter by writing a balanced chemical equation and solving basic stoichiometric problems. He/she can compare nuclear processes to chemical and physical processes and recognize examples of nuclear decay. The student can identify some impacts of nuclear energy technology on social, political, and economic systems.

A student at this level demonstrates an understanding of the law of conservation of matter by writing balanced chemical equations, predicting products, and analyzing stoichiometric relationships. He/she can interpret equations used to describe nuclear decay. The student can debate the pros and cons of nuclear energy technology on social, political, and economic systems.

A student at this level demonstrates an understanding of the law of conservation of matter by writing balanced chemical equations and analyzing stoichiometric relationships with high levels of complexity. He/she can write equations used to describe nuclear decay. The student can evaluate specific cause and effect relationships between nuclear energy technology and social, political, and economic systems.