

LONG BRANCH PUBLIC SCHOOLS

Chemistry Pacing Guide

Marking Period 1				ELA Common Core Standards							
Day	Unit	Topic	Desired Outcome	NGSS	Reading	Writing	S & L	Math	21st Century	Technology	
Opening Day 1			Rules, Procedures, Syllabus,								
Opening Day 2			Pre-Test (Benchmark 1), Safety								
1	Unit 1	Data Analysis			RST.11-12.1 RST.11-12.7		SL.11-12.5	MP.2 MP.4 HSN-Q.A.1 HSN-Q.A.2 HSN-Q.A.3	9.1	8.1 & 8.2	
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3											
4	Unit 2	Matter	Use the periodic table as a model to predict the relative properties of elements based on the patterns of electrons in the outermost energy level of atoms. [Clarification Statement: Examples of properties that could be predicted from patterns could include reactivity of metals, types of bonds formed, numbers of bonds formed, and reactions with oxygen.]	HS-PS1-1	RST.11-12.1 RST.11-12.7	WHST.9-12.2 WHST.9-12.5 WHST.9-12.7 WHST.11-12.8 WHST.9-12.9	SL.11-12.5	MP.2 MP.4 HSN-Q.A.1 HSN-Q.A.2 HSN-Q.A.3	9.1	8.1 & 8.2	
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6											
7											Summative Assessment
8	Unit 3	Atoms, Arrangement and Periodic Law	Use the periodic table as a model to predict the relative properties of elements based on the patterns of electrons in the outermost energy level of atoms. [Clarification Statement: Examples of properties that could be predicted from patterns could include reactivity of metals, types of bonds formed, numbers of bonds formed, and reactions with oxygen.]	HS-PS1-1	RST.11-12.1 RST.11-12.7	WHST.9-12.2 WHST.9-12.5 WHST.9-12.7 WHST.11-12.8 WHST.9-12.9	SL.11-12.5	MP.2 MP.4 HSN-Q.A.1 HSN-Q.A.2 HSN-Q.A.3	9.1	8.1 & 8.2	
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12											
13											Summative Assessment
14	Unit 4	Chemical Formulas and Bonding	Construct and revise an explanation for the outcome of a simple chemical reaction based on the outermost electron states of atoms, trends in the periodic table, and knowledge of the patterns of chemical properties. [Clarification Statement: Examples of chemical reactions could include the reaction of sodium and chlorine, of carbon and oxygen, or of carbon and hydrogen.]	HS-PS1-2	RST.11-12.1 RST.11-12.7	WHST.9-12.2 WHST.9-12.5 WHST.9-12.7 WHST.11-12.8 WHST.9-12.9	SL.11-12.5	MP.2 MP.4 HSN-Q.A.1 HSN-Q.A.2 HSN-Q.A.3	9.1	8.1 & 8.2	
15											
16			Summative Assessment/RST								
17				Use mathematical representations to support the claim that atoms, and therefore mass, are conserved during a chemical reaction. [Clarification Statement: Emphasis is on using mathematical ideas to communicate the proportional relationships between masses of atoms in the reactants and the products, and the translation of these relationships to the macroscopic scale using the mole as the conversion from the atomic to the macroscopic scale. Emphasis is on assessing students' use of mathematical thinking and not on memorization and rote application of problem-solving techniques.]	HS-PS1-7	RST.11-12.1 RST.11-12.7	WHST.9-12.2 WHST.9-12.5 WHST.9-12.7 WHST.11-12.8 WHST.9-12.9	SL.11-12.5	MP.2 MP.4 HSN-Q.A.1 HSN-Q.A.2 HSN-Q.A.3	9.1	8.1 & 8.2
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Marking Period 2

Day	Unit	Topic	Desired Outcome	ELA Common Core Standards								
				NGSS	Reading	Writing	S & L	Math	21st Century	Technology		
1	Unit 5	Chemical Quantities	Construct and revise an explanation for the outcome of a simple chemical reaction based on the outermost electron states of atoms, trends in the periodic table, and knowledge of the patterns of chemical properties. [Clarification Statement: Examples of chemical reactions could include the reaction of sodium and chlorine, of carbon and oxygen, or of carbon and hydrogen.]	HS-PS1-2	RST.11-12.1 RST.11-12.7	WHST.9-12.2 WHST.9-12.5 WHST.9-12.7 WHST.11-12.8 WHST.9-12.9	SL.11-12.5	MP.2 MP.4 HSN-Q.A.1 HSN-Q.A.2 HSN-Q.A.3	9.1	8.1 & 8.2		
2			Use mathematical representations to support the claim that atoms, and therefore mass, are conserved during a chemical reaction. [Clarification Statement: Emphasis is on using mathematical ideas to communicate the proportional relationships between masses of atoms in the reactants and the products, and the translation of these relationships to the macroscopic scale using the mole as the conversion from the atomic to the macroscopic scale. Emphasis is on assessing students' use of mathematical thinking and not on memorization and rote application of problem-solving techniques.]	HS-PS1-7	RST.11-12.1 RST.11-12.7	WHST.9-12.2 WHST.9-12.5 WHST.9-12.7 WHST.11-12.8 WHST.9-12.9	SL.11-12.5	MP.2 MP.4 HSN-Q.A.1 HSN-Q.A.2 HSN-Q.A.3	9.1	8.1 & 8.2		
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6			Summative Assessment									
7	Unit 6	Chemical Equations and Reactions	Use mathematical representations to support the claim that atoms, and therefore mass, are conserved during a chemical reaction. [Clarification Statement: Emphasis is on using mathematical ideas to communicate the proportional relationships between masses of atoms in the reactants and the products, and the translation of these relationships to the macroscopic scale using the mole as the conversion from the atomic to the macroscopic scale. Emphasis is on assessing students' use of mathematical thinking and not on memorization and rote application of problem-solving techniques.]	HS-PS1-7	RST.11-12.1 RST.11-12.7	WHST.9-12.2 WHST.9-12.5 WHST.9-12.7 WHST.11-12.8 WHST.9-12.9	SL.11-12.5	MP.2 MP.4 HSN-Q.A.1 HSN-Q.A.2 HSN-Q.A.3	9.1	8.1 & 8.2		
8			Develop a model to illustrate that the release or absorption of energy from a chemical reaction system depends upon the changes in total bond energy. [Clarification Statement: Emphasis is on the idea that a chemical reaction is a system that affects the energy change. Examples of models could include molecular-level drawings and diagrams of reactions, graphs showing the relative energies of reactants and products, and representations showing energy is conserved.]	HS-PS1-4	RST.11-12.1 RST.11-12.7	WHST.9-12.2 WHST.9-12.5 WHST.9-12.7 WHST.11-12.8 WHST.9-12.9	SL.11-12.5	MP.2 MP.4 HSN-Q.A.1 HSN-Q.A.2 HSN-Q.A.3	9.1	8.1 & 8.2		
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12			Summative Assessment									
13	Unit 7	Chemical Quantities	Use mathematical representations to support the claim that atoms, and therefore mass, are conserved during a chemical reaction. [Clarification Statement: Emphasis is on using mathematical ideas to communicate the proportional relationships between masses of atoms in the reactants and the products, and the translation of these relationships to the macroscopic scale using the mole as the conversion from the atomic to the macroscopic scale. Emphasis is on assessing students' use of mathematical thinking and not on memorization and rote application of problem-solving techniques.]	HS-PS1-7	RST.11-12.1 RST.11-12.7	WHST.9-12.2 WHST.9-12.5 WHST.9-12.7 WHST.11-12.8 WHST.9-12.9	SL.11-12.5	MP.2 MP.4 HSN-Q.A.1 HSN-Q.A.2 HSN-Q.A.3	9.1	8.1 & 8.2		
14			Develop a model to illustrate that the release or absorption of energy from a chemical reaction system depends upon the changes in total bond energy. [Clarification Statement: Emphasis is on the idea that a chemical reaction is a system that affects the energy change. Examples of models could include molecular-level drawings and diagrams of reactions, graphs showing the relative energies of reactants and products, and representations showing energy is conserved.]	HS-PS1-4	RST.11-12.1 RST.11-12.7	WHST.9-12.2 WHST.9-12.5 WHST.9-12.7 WHST.11-12.8 WHST.9-12.9	SL.11-12.5	MP.2 MP.4 HSN-Q.A.1 HSN-Q.A.2 HSN-Q.A.3	9.1	8.1 & 8.2		
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17												
18												
19	Summative Assessment											
20	Midterm Review											
21	Midterms											
22	Midterms											

Marking Period 3

Day	Unit	Topic	Desired Outcome	ELA Common Core Standards							
				NGSS	Reading	Writing	S & L	Math	21st Century	Technology	
1	Unit 8	Structure of Solids and Liquids	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. [Clarification Statement: Emphasis is on understanding the strengths of forces between particles, not on naming specific intermolecular forces (such as dipole-dipole). Examples of particles could include ions, atoms, molecules, and networked materials (such as graphite). Examples of bulk properties of substances could include the melting point and boiling point, vapor pressure, and surface tension.]	HS-PS1-3	RST.11-12.1 RST.11-12.7	WHST.9-12.2 WHST.9-12.5 WHST.9-12.7 WHST.11-12.8 WHST.9-12.9	SL.11-12.5	MP.2 MP.4 HSN-Q.A.1 HSN-Q.A.2 HSN-Q.A.3	9.1	8.1 & 8.2	
2											
3											Summative Assessment
4	Unit 9	Gases	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. [Clarification Statement: Emphasis is on understanding the strengths of forces between particles, not on naming specific intermolecular forces (such as dipole-dipole). Examples of particles could include ions, atoms, molecules, and networked materials (such as graphite). Examples of bulk properties of substances could include the melting point and boiling point, vapor pressure, and surface tension.]	HS-PS1-3	RST.11-12.1 RST.11-12.7	WHST.9-12.2 WHST.9-12.5 WHST.9-12.7 WHST.11-12.8 WHST.9-12.9	SL.11-12.5	MP.2 MP.4 HSN-Q.A.1 HSN-Q.A.2 HSN-Q.A.3	9.1	8.1 & 8.2	
5											Refine the design of a chemical system by specifying a change in conditions that would produce increased amounts of products at equilibrium.* [Clarification Statement: Emphasis is on the application of Le Chatelier's Principle and on refining designs of chemical reaction systems, including descriptions of the connection between changes made at the macroscopic level and what happens at the molecular level. Examples of designs could include different ways to increase product formation including adding reactants or removing products.]
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9		Summative Assessment									
10	Unit 10	Solutions	Apply scientific principles and evidence to provide an explanation about the effects of changing the temperature or concentration of the reacting particles on the rate at which a reaction occurs. [Clarification Statement: Emphasis is on student reasoning that focuses on the number and energy of collisions between molecules.]	HS-PS1-5	RST.11-12.1 RST.11-12.7	WHST.9-12.2 WHST.9-12.5 WHST.9-12.7 WHST.11-12.8 WHST.9-12.9	SL.11-12.5	MP.2 MP.4 HSN-Q.A.1 HSN-Q.A.2 HSN-Q.A.3	9.1	8.1 & 8.2	
11											
12											
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14											
15	Summative Assessment										
16	Unit 11	Acid Base Reactions	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. [Clarification Statement: Emphasis is on understanding the strengths of forces between particles, not on naming specific intermolecular forces (such as dipole-dipole). Examples of particles could include ions, atoms, molecules, and networked materials (such as graphite). Examples of bulk properties of substances could include the melting point and boiling point, vapor pressure, and surface tension.]	HS-PS1-3	RST.11-12.1 RST.11-12.7	WHST.9-12.2 WHST.9-12.5 WHST.9-12.7 WHST.11-12.8 WHST.9-12.9	SL.11-12.5	MP.2 MP.4 HSN-Q.A.1 HSN-Q.A.2 HSN-Q.A.3	9.1	8.1 & 8.2	
17											Refine the design of a chemical system by specifying a change in conditions that would produce increased amounts of products at equilibrium.* [Clarification Statement: Emphasis is on the application of Le Chatelier's Principle and on refining designs of chemical reaction systems, including descriptions of the connection between changes made at the macroscopic level and what happens at the molecular level. Examples of designs could include different ways to increase product formation including adding reactants or removing products.]
18											
19											
20		Summative Assessment									
21	Various State Testing on Various Day in Marking Period 3										
22											

Marking Period 4

Day	Unit	Topic	Desired Outcome	ELA Common Core Standards							
				NGSS	Reading	Writing	S & L	Math	21st Century	Technology	
1	Unit 12	Kinetics	Apply scientific principles and evidence to provide an explanation about the effects of changing the temperature or concentration of the reacting particles on the rate at which a reaction occurs. [Clarification Statement: Emphasis is on student reasoning that focuses on the number and energy of collisions between molecules.]	HS-PS1-5	RST.11-12.1 RST.11-12.7	WHST.9-12.2 WHST.9-12.5 WHST.9-12.7 WHST.11-12.8 WHST.9-12.9	SL.11-12.5	MP.2 MP.4 HSN-Q.A.1 HSN-Q.A.2 HSN-Q.A.3	9.1	8.1 & 8.2	
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3											
4											
5											
6	Summative Assessment										
7	Unit 13	Equilibrium	Refine the design of a chemical system by specifying a change in conditions that would produce increased amounts of products at equilibrium.* [Clarification Statement: Emphasis is on the application of Le Chatelier's Principle and on refining designs of chemical reaction systems, including descriptions of the connection between changes made at the macroscopic level and what happens at the molecular level. Examples of designs could include different ways to increase product formation including adding reactants or removing products.]	HS-PS1-6	RST.11-12.1 RST.11-12.7	WHST.9-12.2 WHST.9-12.5 WHST.9-12.7 WHST.11-12.8 WHST.9-12.9	SL.11-12.5	MP.2 MP.4 HSN-Q.A.1 HSN-Q.A.2 HSN-Q.A.3	9.1	8.1 & 8.2	
8											
9											
10	Summative Assessment										
11	Unit 14	Redox-Electro	Use mathematical representations to support the claim that atoms, and therefore mass, are conserved during a chemical reaction. [Clarification Statement: Emphasis is on using mathematical ideas to communicate the proportional relationships between masses of atoms in the reactants and the products, and the translation of these relationships to the macroscopic scale using the mole as the conversion from the atomic to the macroscopic scale. Emphasis is on assessing students' use of mathematical thinking and not on memorization and rote application of problem-solving techniques.]	HS-PS1-7	RST.11-12.1 RST.11-12.7	WHST.9-12.2 WHST.9-12.5 WHST.9-12.7 WHST.11-12.8 WHST.9-12.9	SL.11-12.5	MP.2 MP.4 HSN-Q.A.1 HSN-Q.A.2 HSN-Q.A.3	9.1	8.1 & 8.2	
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13											
14											
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16	Summative Assessment										
17	Unit 15	Nuclear	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. [Clarification Statement: Emphasis is on simple qualitative models, such as pictures or diagrams, and on the scale of energy released in nuclear processes relative to other kinds of transformations.]	HS-PS1-8	RST.11-12.1 RST.11-12.7	WHST.9-12.2 WHST.9-12.5 WHST.9-12.7 WHST.11-12.8 WHST.9-12.9	SL.11-12.5	MP.2 MP.4 HSN-Q.A.1 HSN-Q.A.2 HSN-Q.A.3	9.1	8.1 & 8.2	
18											
19											
20	Summative Assessment										
21	Final Exams										
22											
23											