

COURSE TITLE

Honors Chemistry

LENGTH

Full Year

DEPARTMENT

STEM Department

SCHOOL

Rutherford High School

DATE

September 10, 2018

Honors Chemistry

I. Introduction/Overview/Philosophy

Students in this course will develop an understanding of key concepts that help them make sense of chemical and physical based sciences. The ideas are building upon students' science understanding of disciplinary core ideas, science and engineering practices, and crosscutting concepts from earlier grades. There are five life science topics that will be addressed through this course: chemistry laboratory skills, the classification and structure of matter, ratio and proportion of chemical reactions, physical chemistry, acid-base chemistry, kinetics, thermodynamics, electrochemistry, and organic chemistry. Critical thinking (the ability to carry out systematic thought processes in making decisions and solving problems), inquiry (solving problems through scientific investigation) and science ethics are stressed in this class.

The performance expectations for high school chemistry blend core ideas with scientific and engineering practices and crosscutting concepts to support students in developing useable knowledge that can be applied across the science disciplines. While the performance expectations in high school chemistry couple particular practices with specific disciplinary core ideas, instructional decisions should include use of many practices underlying the performance expectations. Through a variety of laboratory and hands-on activities, students will investigate areas of chemistry. The goal of the course is to instill in students the belief that chemistry is an exciting, relevant, and will apply to both their personal and professional futures.

II. Objectives

Course Outline:

1. Matter and Energy
 - a. Define chemistry
 - b. Properties of matter
 - c. States of matter
 - d. Elements compounds and mixtures
2. Measurements
 - a. Metric System review
 - b. Dimensional analysis
 - c. Significant figures
 - d. Density
 - e. Temperature
3. The Atom
 - a. Structure of the Atom
 - b. Atomic numbers
 - c. Avogadro's Number and the mole
 - d. Atomic Weight and mass mole relations
4. Arrangement of Electrons
 - a. Electromagnetic Energy
 - b. Electromagnetic Energy calculations
 - c. Quantum Numbers

- d. Electron configuration, orbital notation, electron dot diagrams
- 5. Periodic Table
 - a. Development of the Periodic table
 - b. Periodic properties
 - c. Periodic Law
- 6. Chemical Bonds
 - a. Types of Chemical Bonds
 - b. Electronegativity
 - c. Ionic Bonds
 - d. Oxidation/Reduction
 - e. Covalent Bonds
 - f. Hydride orbitals
 - g. Shapes of Covalent Molecules
- 7. Chemical Compounds
 - a. Nomenclature
 - b. Formula Weight
 - c. Percent composition and empirical formulas
 - d. Law of Constant Composition and Multiple Proportions
- 8. Chemical Reactions
 - a. Types of Equations
 - b. Balancing equations
 - c. Predicting chemical reactions
- 9. Stoichiometry
 - a. Mole-mole stoichiometry
 - b. Mass-mass stoichiometry
 - c. Limiting reactants
 - d. Percent yield
- 10. The Gas Laws
 - a. Kinetic Theory of gases
 - b. The gas laws
 - c. Molecular composition of gases
 - d. Gas law stoichiometry
- 11. Solutions
 - a. Types of Solutions
 - b. The Solution Process
 - c. Molarity and molality
 - d. Colligative Properties
 - e. Aqueous solutions Acids and Bases
- 12. Flow of Energy
 - a. Enthalpies of Formation
 - b. Energy from Fossil Fuels
 - c. Oxidation/Reduction
- 13. Biochemistry
 - a. Organic Chemistry
 - b. Protein- Structure and Function
 - c. DNA
- 14. Nuclear
 - a. Nuclear Science

b. Radioactivity

Student Outcomes:

After successfully completing this course, the student will:

- Construct explanations for the role of energy in the cycling of matter in organisms and ecosystems
- Formulate answers to the question "how and why do organisms interact with each other (biotic factors) and their environment (abiotic factors), and what affects these interactions?" Secondary ideas include the interdependent relationships in ecosystems; dynamics of ecosystems; and functioning, resilience, and social interactions, including group behavior.
- Examine factors that have influenced the distribution and development of human society; these factors include climate, natural resource availability, and natural disasters. Students use computational representations to analyze how earth systems and their relationships are being modified by human activity.
- Utilize mathematical models to provide support for conceptual understanding of systems and students' ability to design, evaluate, and refine solutions for reducing the impact of human activities on the environment and maintaining biodiversity. Students will additionally create or revise a simulation to test solutions for mitigating adverse impacts of human activity on biodiversity.
- Investigate explanations for the structure and functions of cells as the basic unit of life, of hierarchical organization of interacting organ systems, and of the role of specialized cells for maintenance and growth.
- Analyze data and develop models to make sense of the relationship between DNA and chromosomes in the process of cellular division, which passes traits from one generation to the next. Students determine why individuals of the same species vary in how they look, function, and behave. Students explain the mechanisms of genetic inheritance and describe the environmental and genetic causes of gene mutation and the alteration of gene expressions.
- Develop an understanding of the factors causing natural selection of species over time. They will also demonstrate and understandings of how multiple lines of evidence contribute to the strength of scientific theories of natural selection.
- Evaluate evidence of the conditions that may result in new species and understand the role of genetic variation in natural selection. Students demonstrate an understanding of these concepts by obtaining, evaluating, and communicating information and constructing explanations and designing solutions.

New Jersey Student Learning Standards***CAREER READY PRACTICES******CRPI Act as a responsible and contributing citizen and employee.***

Career-ready individuals understand the obligations and responsibilities of being a member of a community, and they demonstrate this understanding every day through their interactions with others. They are conscientious of the impacts of their decisions on others and the environment around them. They think about the near-term and long-term consequences of their actions and seek to act in ways that contribute to the betterment of their teams, families, community and workplace. They are reliable and consistent in going beyond the minimum expectation and in participating in activities that serve the greater good.

CRP2 Apply appropriate academic and technical skills.

Career-ready individuals readily access and use the knowledge and skills acquired through experience and education to be more productive. They make connections between abstract concepts with real-world applications, and they make correct insights about when it is appropriate to apply the use of an academic skill in a workplace situation

CRP4 Communicate clearly and effectively and with reason.

Career-ready individuals communicate thoughts, ideas, and action plans with clarity, whether using written, verbal, and/or visual methods. They communicate in the workplace with clarity and purpose to make maximum use of their own and others' time. They are excellent writers; they master conventions, word choice, and organization, and use effective tone and presentation skills to articulate ideas. They are skilled at interacting with others; they are active listeners and speak clearly and with purpose. Career-ready individuals think about the audience for their communication and prepare accordingly to ensure the desired outcome.

CRP5. Consider the environmental, social and economic impacts of decisions.

Career-ready individuals understand the interrelated nature of their actions and regularly make decisions that positively impact and/or mitigate negative impact on other people, organization, and the environment. They are aware of and utilize new technologies, understandings, procedures, materials, and regulations affecting the nature of their work as it relates to the impact on the social condition, the environment and the profitability of the organization.

CRP6. Demonstrate creativity and innovation.

Career-ready individuals regularly think of ideas that solve problems in new and different ways, and they contribute those ideas in a useful and productive manner to improve their organization. They can consider unconventional ideas and suggestions as solutions to issues, tasks or problems, and they discern which ideas and suggestions will add greatest value. They seek new methods, practices, and ideas from a variety of sources and seek to apply those ideas to their own workplace. They take action on their ideas and understand how to bring innovation to an organization.

CRP7. Employ valid and reliable research strategies.

Career-ready individuals are discerning in accepting and using new information to make decisions, change practices or inform strategies. They use reliable research process to search for new information. They evaluate the validity of sources when considering the use and adoption of external information or practices in their workplace situation.

CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.

Career-ready individuals readily recognize problems in the workplace, understand the nature of the problem, and devise effective plans to solve the problem. They are aware of problems when they occur and take action quickly to address the problem; they thoughtfully investigate the root cause of the problem prior to introducing solutions. They carefully consider the options to solve the problem. Once a solution is agreed upon, they follow through to ensure the problem is solved, whether through their own actions or the actions of others.

CRP9. Model integrity, ethical leadership and effective management.

Career-ready individuals consistently act in ways that align personal and community-held ideals and principles while employing strategies to positively influence others in the workplace. They have a clear understanding of integrity and act on this understanding in every decision. They use a variety of means to positively impact the directions and actions of a team or organization, and they apply insights into human behavior to change others'

action, attitudes and/or beliefs. They recognize the near-term and long-term effects that management's actions and attitudes can have on productivity, morals and organizational culture.

CRP10. Plan education and career pathHS-aligned to personal goals.

Career-ready individuals take personal ownership of their own education and career goals, and they regularly act on a plan to attain these goals. They understand their own career interests, preferences, goals, and requirements. They have perspective regarding the pathways available to them and the time, effort, experience and other requirements to pursue each, including a path of entrepreneurship. They recognize the value of each step in the education and experiential process, and they recognize that nearly all career pathHS-require ongoing education and experience. They seek counselors, mentors, and other experts to assist in the planning and execution of career and personal goals.

CRP11. Use technology to enhance productivity.

Career-ready individuals find and maximize the productive value of existing and new technology to accomplish workplace tasks and solve workplace problems. They are flexible and adaptive in acquiring new technology. They are proficient with ubiquitous technology applications. They understand the inherent risks-personal and organizational-of technology applications, and they take actions to prevent or mitigate these risks.

CRP12. Work productively in teams while using cultural global competence.

Career-ready individuals positively contribute to every team, whether formal or informal. They apply an awareness of cultural difference to avoid barriers to productive and positive interaction. They find ways to increase the engagement and contribution of all team members. They plan and facilitate effective team meetings.

TECHNOLOGY STANDARDS

Standard 8.1 Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.

Strand A. Technology Operations and Concepts: Students demonstrate a sound understanding of technology concepts, systems and operations.

8.1.12.A.4- Construct a spreadsheet workbook with multiple worksheets, rename tabs to reflect the data on the worksheet, and use mathematical or logical functions, charts and data from all worksheets to convey the results.

8.1.12.A.5- Create a report from a relational database consisting of at least two tables and describe the process, and explain the report results.

21ST CENTURY LIFE AND CAREERS

9.2 Career Awareness, Exploration, and Preparation

Strand C: Career Preparation

9.2.12.C.1 Review career goals and determine steps necessary for attainment.

9.2.12.C.2 Modify Personalized Student Learning Plans to support declared career goals.

9.2.12.C.3 Identify transferable career skills and design alternate career plans.

COMPANION STANDARDS FOR SCIENCE AND TECHNICAL SUBJECTS

RST.9-10.3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.

RST.9-10.4. 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 9-10 texts and topics.

RST.9-10.5. Analyze the relationships among concepts in a text, including relationships among key terms (e.g., force, friction, reaction force, energy).

RST.9-10.7. Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.

RST.9-10.9. Compare and contrast findings presented in a text to those from other sources (including their own experiments), noting when the findings support or contradict previous explanations or accounts.

WHST.9-10.2. Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes.

WHST.9-10.6. Use technology, including the Internet, to produce, share, and update writing products, taking advantage of technology's capacity to link to other information and to display information flexibly and dynamically.

WHST.9-10.9. Draw evidence from informational texts to support analysis, reflection, and research.

NEW JERSEY STUDENT LEARNING STANDARDS- SCIENCE

HS-PS1-1. 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.

HS-PS1-2. 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

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-PS1-4. 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.

HS-PS1-5. 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.

HS-PS1-6. Refine the design of a chemical system by specifying a change in conditions that would produce increased amounts of products at equilibrium.

HS-PS1-7. Use mathematical representations to support the claim that atoms, and therefore mass, are conserved during a chemical reaction.

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.

HS-PS2-4. Use mathematical representations of Newton's Law of Gravitation and Coulomb's Law to describe and predict the gravitational and electrostatic forces between objects

HS-PS2-6. Communicate scientific and technical information about why the molecular-level structure is important in the functioning of designed materials.

HS-PS3-1. Create a computational model to calculate the change in the energy of one component in a system when the change in energy of the other component(s) and energy flows in and out of the system are known.

HS-PS3-2. Develop and use models to illustrate that energy at the macroscopic scale can be accounted for as a combination of energy associated with the motion of particles (objects) and energy associated with the relative position of particles (objects).

HS-PS3-4. Plan and conduct an investigation to provide evidence that the transfer of thermal energy when two components of different temperature are combined within a closed system results in a more uniform energy distribution among the components in the system (second law of thermodynamics).

HS-PS3-5. Develop and use a model of two objects interacting through electric or magnetic fields to illustrate the forces between objects and the changes in energy of the objects due to the interaction.

III. Proficiency Levels

Honors Chemistry is the second course in the high school honors sequence. Sophomores who meet the Honors selection criteria in their freshman year are recommended for this course.

IV. Methods of Assessment

Student Assessment

The teacher will provide a variety of assessments during the course of the year. The assessment may include but is not limited to: chapter and unit tests and quizzes, simulations, lab reports, application problems, homework, and projects.

Curriculum/Teacher Assessment

The teacher will provide the subject area supervisor with suggestions for changes on an ongoing basis.

V. Grouping

Honors Chemistry is a homogeneously grouped sophomore level course.

VI. Articulation/Scope & Sequence/Time Frame

Course length is one year.

VII. Resources

Texts/Supplemental Reading/References

Resources may include but are not limited to:

1. Text
2. Online Textbooks
 - a. <http://www.ck12.org/book/Chemistry---Second-Edition-%2528CA-DTI3%2529/>
 - b. <http://www.ck12.org/book/CK-12-Chemistry-Intermediate/>
3. Workbook
 - a. POGIL
4. Web-based Resources
 - a. <https://www.teachengineering.org/>
 - b. http://betterlesson.com/next_gen_science
 - c. <http://www.ck12.org/>
 - d. Discovery News: <http://news.discovery.com/>
 - e. SciShow

VIII. Suggested Activities

Appropriate activities are listed below in the curriculum map.

IX. Methodologies

Honors Chemistry is a laboratory science with class time spent on laboratory experiments and hands-on activities. Group instruction, cooperative learning, and individual projects are also utilized.

X. Interdisciplinary Connections

Daily connections are made with mathematics by using scientific notation in problem solving, conversion of units of measure, and numerous chemical formulas with mathematical solutions.

XI. Differentiating Instruction for Students with Special Needs: Students with Disabilities, Students at Risk, English Language Learners, and Gifted & Talented Students

Differentiating instruction is a flexible process that includes the planning and design of instruction, how that instruction is delivered, and how student progress is measured. Teachers recognize that students can learn in multiple ways as they celebrate students' prior knowledge. By providing appropriately challenging learning, teachers can maximize success for all students.

Differentiating in this course includes but is not limited to:

Differentiation for Support (ELL, Special Education, Students at Risk)

- Peer mentoring on problems
- Differentiated teacher feedback on assignments
- Modeling out problems on whiteboard
- Visual aids as we project problems on whiteboard
- Study guides
- Tiered assignments
- Scaffolding of materials and assignments
- Re-teaching and review
- Guided note taking
- Exemplars of varied performance levels
- Multi-media approach to accommodating various learning styles

Differentiation for Enrichment

- Supplemental reading material for independent study
- Flexible grouping
- Tiered assignments
- Topic selection by interest
- Enhanced expectations for independent study
- Elevated questioning techniques using Webb's Depth of Knowledge matrix

XII. Professional Development

The teacher will continue to improve expertise through participation in a variety of professional development opportunities.

XII. Curriculum Map/Pacing Guide

Unit Topic	Time Allocated	Differentiating Instruction for Students with Disabilities, Students at Risk, English Language Learners, & Gifted & Talented Students	Standards	Assessments
Matter and Energy <ul style="list-style-type: none"> define chemistry properties of matter states of matter elements compounds and mixtures 	4 weeks	<i>Support</i> <ul style="list-style-type: none"> Guided notes Modified homework assignments Modified assessments <i>Enrichment</i> <ul style="list-style-type: none"> Provide extension activities Adjusting the pace of lessons Curriculum compacting 	HS-PS1-1 HS-PS1-3 CRP1,4,6,7,8,9,10,12 9.2.12.C.1,2,3	<i>Formative Assessment:</i> Homework, Questioning, Entry/Exit Tickets Classwork, Group and Cooperative Work Lab: Observation <i>Summative Assessment</i> Quiz: Matter and Energy Unit TEST: Matter and Energy
Measurements <ul style="list-style-type: none"> metric System review dimensional analysis significant figures density temperature 	3 weeks	<i>Support</i> <ul style="list-style-type: none"> Use of visual and multi-sensory formats Use of assisted technology Use of prompts Khan Academy <i>Enrichment</i> <ul style="list-style-type: none"> Inquiry-based instruction Independent study Higher-order thinking skills 	HS-PS1-3 CRP1,4,6,7,8,9,10,12 8.1.12.A.4,5 RST.9-10.3,4,5	<i>Formative Assessment:</i> Homework, Questioning, Entry/Exit Tickets Classwork, Group and Cooperative Work Lab: Density <i>Summative Assessment</i> Quiz: Metric Conversions and Density Unit TEST: Measurements Quarterly Benchmark unit 1 and 2
The Atom <ul style="list-style-type: none"> Structure of the Atom atomic numbers Avogadro's Number and the 	3 weeks	<i>Support</i> <ul style="list-style-type: none"> Rephrase questions, directions, and explanations Modification of content and student 	HS-PS1-1 HS-PS1-2 HS-PS1-3 HS-PS1-8	<i>Formative Assessment:</i> Homework, Questioning, Entry/Exit Tickets Classwork, Group and Cooperative

Unit Topic	Time Allocated	Differentiating Instruction for Students with Disabilities, Students at Risk, English Language Learners, & Gifted & Talented Students	Standards	Assessments
mole ● Atomic Weight and mass mole relations		products <ul style="list-style-type: none"> Testing accommodations Authentic assessments <i>Enrichment</i> <ul style="list-style-type: none"> Interest-based content Student-driven projects Real-world problems and scenarios 	CRP1,4,6,7,8,9,10,12 WHST.9-10.2,6,9	Work <i>Summative Assessment</i> Quiz: Atomic theory TEST: Atomic theory and calculations
Arrangement of Electrons <ul style="list-style-type: none"> Electromagnetic Energy Electromagnetic Energy calculations Quantum Numbers Electron configuration, orbital notation, electron dot diagrams 	4 weeks	<i>Support</i> <ul style="list-style-type: none"> Pre-teaching of vocabulary and concepts Visual learning, including graphic organizers Use of cognates to increase comprehension <i>Enrichment</i> <ul style="list-style-type: none"> Khan Academy Critical/Analytical thinking tasks 	HS-PS1-1 HS-PS1-3 CRP1,4,6,7,8,9,10,12	<i>Formative Assessment:</i> Homework, Questioning, Entry/Exit Tickets Classwork, Group and Cooperative Work <i>Summative Assessment</i> Quiz: Radiant Energy TEST: Arrangement of Electrons
Periodic Table <ul style="list-style-type: none"> Development of the Periodic table Periodic properties Periodic Law 	3 weeks	<i>Support</i> <ul style="list-style-type: none"> Guided notes Modified homework assignments Modified assessments <i>Enrichment</i> <ul style="list-style-type: none"> Provide extension activities Adjusting the pace of lessons Curriculum compacting 	HS-PS1-1 HS-PS1-3 HS-PS2-6 CRP1,4,6,7,8,9,10,12 8.1.12.A.4,5 RST.9-10.7,9	<i>Formative Assessment:</i> Homework, Questioning, Entry/Exit Tickets Classwork, Group and Cooperative Work <i>Summative Assessment</i> Quiz: Arrangement of the Periodic Table Quarterly Benchmark unit 3,4,5
Chemical Bonds <ul style="list-style-type: none"> Types of Chemical Bonds Electronegativity Ionic Bonds Oxidation/Reduction Covalent Bonds 	4 weeks	<i>Support</i> <ul style="list-style-type: none"> Use of visual and multi-sensory formats Use of assisted technology Use of prompts 	HS-PS1-1 HS-PS1-3 HS-PS1-4 HS-PS1-5 HS-PS2-6 CRP1,4,6,7,8,9,10,12	<i>Formative Assessment:</i> Homework, Questioning, Entry/Exit Tickets Classwork, Group and Cooperative Work

Unit Topic	Time Allocated	Differentiating Instruction for Students with Disabilities, Students at Risk, English Language Learners, & Gifted & Talented Students	Standards	Assessments
<ul style="list-style-type: none"> Hydride orbitals Shapes of Covalent Molecules 		<ul style="list-style-type: none"> Khan Academy <p><i>Enrichment</i></p> <ul style="list-style-type: none"> Inquiry-based instruction Independent study Higher-order thinking skills 		<p><i>Summative Assessment</i></p> <p>Quiz: Bond types</p> <p>TEST: Chemical Bonds</p>
<p>Chemical Compounds</p> <ul style="list-style-type: none"> Nomenclature Formula Weight percent composition and empirical formulas Law of Constant Composition and Multiple Proportions 	4 weeks	<p><i>Support</i></p> <ul style="list-style-type: none"> Rephrase questions, directions, and explanations Modification of content and student products Testing accommodations Authentic assessments <p><i>Enrichment</i></p> <ul style="list-style-type: none"> Interest-based content Student-driven projects Real-world problems and scenarios 	HS-PS1-1 HS-PS1-3 HS-PS2-6 CRP1,4,6,7,8,9,10,12	<p><i>Formative Assessment:</i></p> <p>Homework, Questioning, Entry/Exit Tickets</p> <p>Classwork, Group and Cooperative Work</p> <p><i>Summative Assessment</i></p> <p>Quiz: Nomenclature</p> <p>TEST: Chemical Compounds</p>
<p>Chemical Reactions</p> <ul style="list-style-type: none"> Types of Equations Balancing equations predicting chemical reactions 	2 weeks	<p><i>Support</i></p> <ul style="list-style-type: none"> Pre-teaching of vocabulary and concepts Visual learning, including graphic organizers Use of cognates to increase comprehension <p><i>Enrichment</i></p> <ul style="list-style-type: none"> Khan Academy Critical/Analytical thinking tasks 	HS-PS1-1 HS-PS1-2 HS-PS1-3 HS-PS1-4 HS-PS1-6 CRP1,4,6,7,8,9,10,12	<p><i>Formative Assessment:</i></p> <p>Homework, Questioning, Entry/Exit Tickets</p> <p>Classwork, Group and Cooperative Work</p> <p><i>Summative Assessment</i></p> <p>Quiz: word to formula and balancing equations</p> <p>Quiz: Predicting Chemical reactions</p>
<p>Stoichiometry</p> <ul style="list-style-type: none"> mole-mole stoichiometry mass-mass stoichiometry limiting reactants percent yield 	2 weeks	<p><i>Support</i></p> <ul style="list-style-type: none"> Guided notes Modified homework assignments Modified assessments 	HS-PS1-2 HS-PS1-7 CRP1,4,6,7,8,9,10,12	<p><i>Formative Assessment:</i></p> <p>Homework, Questioning on Stoichiometry, Entry/Exit Tickets</p> <p>Classwork, Group and Cooperative Work</p> <p>Lab: Stoichiometry</p>

Unit Topic	Time Allocated	Differentiating Instruction for Students with Disabilities, Students at Risk, English Language Learners, & Gifted & Talented Students	Standards	Assessments
		<i>Enrichment</i> <ul style="list-style-type: none"> • Provide extension activities • Adjusting the pace of lessons • Curriculum compacting 		<i>Summative Assessment</i> QUIZ: Stoichiometry Quarterly Benchmark unit 6-9
The Gas Laws <ul style="list-style-type: none"> • Kinetic Theory of gases • the gas laws • molecular composition of gases • gas law stoichiometry 	3 weeks	<i>Support</i> <ul style="list-style-type: none"> • Use of visual and multi-sensory formats • Use of assisted technology • Use of prompts • Khan Academy <i>Enrichment</i> <ul style="list-style-type: none"> • Inquiry-based instruction • Independent study • Higher-order thinking skills 	HS-PS1-2 HS-PS1-3 HS-PS1-5 CRP1,4,6,7,8,9,10,12 8.1.12.A.4,5 RST.9-10.3,4,5	<i>Formative Assessment:</i> Homework, Questioning, Entry/Exit Tickets Classwork, Group and Cooperative Work on Gas Laws Lab: Charles Law Activity: Gas Law Activity <i>Summative Assessment</i> Quiz Gas Laws Unit TEST; The Gas Laws TEST Benchmark Assessment
Solutions <ul style="list-style-type: none"> • Types of Solutions • The Solution Process • Molarity and molality • Colligative Properties • Aqueous solutions Acids and Bases 	3 weeks	<i>Support</i> <ul style="list-style-type: none"> • Rephrase questions, directions, and explanations • Modification of content and student products • Testing accommodations • Authentic assessments <i>Enrichment</i> <ul style="list-style-type: none"> • Interest-based content • Student-driven projects • Real-world problems and scenarios 	HS-PS1-1 HS-PS1-2 HS-PS1-3 HS-PS1-5 HS-PS2-6 CRP1,4,6,7,8,9,10,12	<i>Formative Assessment:</i> Homework, Questioning, Entry/Exit Tickets Classwork, Group and Cooperative Work Lab: Solubility Activity <i>Summative Assessment:</i> Quiz: Solutions Quiz: Acids and Bases Unit Test Solutions
Flow of Energy <ul style="list-style-type: none"> • Enthalpies of Formation • Energy from Fossil Fuels 	2 week	<i>Support</i> <ul style="list-style-type: none"> • Pre-teaching of vocabulary and concepts 	HS-PS1-2 HS-PS1-4 HS-PS1-5	<i>Formative Assessment:</i> Homework, Questioning, Entry/Exit Tickets

Unit Topic	Time Allocated	Differentiating Instruction for Students with Disabilities, Students at Risk, English Language Learners, & Gifted & Talented Students	Standards	Assessments
<ul style="list-style-type: none"> Oxidation/Reduction 		<ul style="list-style-type: none"> Visual learning, including graphic organizers Use of cognates to increase comprehension <p><i>Enrichment</i></p> <ul style="list-style-type: none"> Khan Academy Critical/Analytical thinking tasks 	CRP1,4,6,7,8,9,10,12	Classwork, Group and Cooperative Work <i>Summative Assessment:</i> Quiz
<p>Biochemistry</p> <ul style="list-style-type: none"> Organic Chemistry Protein- Structure and Function DNA 	2 week	<p><i>Support</i></p> <ul style="list-style-type: none"> Guided notes Modified homework assignments Modified assessments <p><i>Enrichment</i></p> <ul style="list-style-type: none"> Provide extension activities Adjusting the pace of lessons Curriculum compacting 	HS-PS1-2 HS-PS1-4 CRP1,4,6,7,8,9,10,12	<p><i>Formative Assessment:</i> Homework, Questioning, Entry/Exit Tickets Classwork, Group and Cooperative Work Lab: Lewis Structure of Amino Acids</p> <p><i>Summative Assessment</i> Quiz: Flow of Energy Unit TEST : Flow of Energy/ Biochemistry</p>
<p>Nuclear</p> <ul style="list-style-type: none"> Nuclear Science Radioactivity 	1 week	<p><i>Support</i></p> <ul style="list-style-type: none"> Use of visual and multi-sensory formats Use of assisted technology Use of prompts Khan Academy <p><i>Enrichment</i></p> <ul style="list-style-type: none"> Inquiry-based instruction Independent study Higher-order thinking skills 	HS-PS1-1 HS-PS1-8 CRP1,4,6,7,8,9,10,12	<p><i>Formative Assessment:</i> Homework, Questioning, Entry/Exit Tickets Classwork, Group and Cooperative Work Lab: Half-life of a Penny Activity</p> <p><i>Summative Assessment</i> Quiz: Nuclear Science</p>