EGG HARBOR TOWNSHIP PUBLIC SCHOOLS
CURRICULUM

GENERAL (Standard) Chemistry
High School

Length of Course:	Full Year
Elective / Required:	Refer to Program of Studies
Schools:	High School
Student Eligibility:	Grades 10 -12
Credit Value:	5 credits
Date Submitted:	September 2013
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DISTRICT MISSION STATEMENT

Our mission in the Egg Harbor Township School District is to partner with the student, family, school, and community to provide a safe learning environment that addresses rigorous and relevant 21st Century standards and best practices which will develop academic scholarship, integrity, leadership, citizenship, and the unique learning style of students, while encouraging them to develop a strong work ethic and to act responsibly in their school community and every day society.

SCIENCE – PHILOSOPHY

We believe that ALL students regardless of race, ethnicity, socio-economic status, religious background, and/or any other classification are deserving of a holistic science education. This holistic approach would include an education that will allow them to fully discover themselves, their strengths and weaknesses, and benefit from science instruction.

> Scientific literacy assumes an increasingly important role in the context of globalization. The rapid pace of technological advances, access to an unprecedented wealth of information, and the pervasive impact of science and technology on day-to-day living require a depth of understanding that can be enhanced through quality science education. In the 21st century, science education focuses on the practices of science that lead to a greater understanding of the growing body of scientific knowledge that is required of citizens in an ever-changing world (NJCCCS-Science).

Science curricula are designed to reinforce 21st Century Learning, to maximize rigor, relevance, and relationships, and to engage students individually through differentiated instruction.

SCIENCE - STATEMENT OF PURPOSE

Education exists for the purpose of enabling each individual to realize and maintain her/his full potential. Scientifically literate students possess the knowledge and understanding of scientific concepts and processes required for personal decision-making, participation in civic and cultural affairs, and economic productivity.

> Science, engineering, and technology influence and permeate every aspect of modern life. Some knowledge of science and engineering is required to engage with the major public policy issues of today as well as to make informed everyday decisions, such as selecting among alternative medical treatments or

> determining how to invest public funds for water supply options. In addition, understanding science and the extraordinary insights it has produced can be meaningful and relevant on a personal level, opening new worlds to explore and offering lifelong opportunities for enriching people's lives. In these contexts, learning science is important for everyone, even those who eventually choose careers in fields other than science or engineering (NJSLS-Science)
>
> All students engage in science experiences that promote the ability to ask, find, or determine answers to questions derived from natural curiosity about everyday things and occurrences. The underpinning of the revised standards lies in the premise that science is experienced as an active process in which inquiry is central to learning and in which students engage in observation, inference, and experimentation on an ongoing basis, rather than as an isolated a process. When engaging in inquiry, students describe objects and events, ask questions, construct explanations, test those explanations against current scientific knowledge, and communicate their ideas to others in their community and around the world. They actively develop their understanding of science by identifying their assumptions, using critical and logical thinking, and considering alternative explanations (NJCCCS-Science).

Our school district provides an extensive science program, which will enable students to succeed and compete in the global marketplace using the New Jersey Student Learning Standards in Science as well as the Next Generation Science Standards.

INTRODUCTION

The most precious resource teachers have is time. Regardless of how much time a course is scheduled for, it is never enough to accomplish all that one would like. Therefore, it is imperative that teachers utilize the time they have wisely in order to maximize the potential for all students to achieve the desired learning.

High quality educational programs are characterized by clearly stated goals for student learning, teachers who are well-informed and skilled in enabling students to reach those goals, program designs that allow for continuous growth over the span of years of instruction, and ways of measuring whether students are achieving program goals.

THE EGG HARBOR TOWNSHIP SCHOOL DISTRICT CURRICULUM TEMPLATE

The Egg Harbor Township School District has embraced the backward-design model as the foundation for all curriculum development for the educational program. When reviewing curriculum documents and the Egg Harbor Township curriculum template, aspects of the backward-design model will be found in the stated enduring *understandings/essential questions, unit assessments,* and *instructional activities*. Familiarization with backward-design is critical to working effectively with Egg Harbor Township's curriculum guides.

GUIDING PRINCIPLES: WHAT IS BACKWARD DESIGN?
WHAT IS UNDERSTANDING BY DESIGN?

"Backward design" is an increasingly common approach to planning curriculum and instruction. As its name implies, "backward design" is based on defining clear goals, providing acceptable evidence of having achieved those goals, and then working 'backward' to identify what actions need to be taken that will ensure that the gap between the current status and the desired status is closed.

Building on the concept of backward design, Grant Wiggins and Jay McTighe (2005) have developed a structured approach to planning programs, curriculum, and instructional units. Their model asks educators to state goals; identify deep understandings, pose essential questions, and specify clear evidence that goals, understandings, and core learning have been achieved.

Programs based on backward design use desired results to drive decisions. With this design, there are questions to consider, such as: What should students understand, know, and be able to do? What does it look like to meet those goals? What kind of program will result in the outcomes stated? How will we know students have achieved that result? What other kinds of evidence will tell us that we have a quality program? These questions apply regardless of whether they are goals in program planning or classroom instruction.

The backward design process involves three interrelated stages for developing an entire curriculum or a single unit of instruction. The relationship from planning to curriculum design, development, and implementation hinges upon the integration of the following three stages.

Stage I: Identifying Desired Results: Enduring understandings, essential questions, knowledge and skills need to be woven into curriculum publications, documents, standards, and scope and sequence materials. Enduring understandings identify the "big ideas" that students will grapple with during the course of the unit. Essential questions provide a unifying focus for the unit and students should be able to answer more deeply and fully these questions as they proceed through the unit. Knowledge and skills are the ***"stuff"*** upon which the understandings are built.

Stage II: Determining Acceptable Evidence: Varied types of evidence are specified to ensure that students demonstrate attainment of desired results. While discrete knowledge assessments (e.g.: multiple choice, fill-in-the-blank, short answer, etc…) will be utilized during an instructional unit, the overall unit assessment is performance-based and asks students to demonstrate that they have mastered the desired understandings. These culminating (summative) assessments are authentic tasks that

students would likely encounter in the real-world after they leave school. They allow students to demonstrate all that they have learned and can do. To demonstrate their understandings students can explain, interpret, apply, provide critical and insightful points of view, show empathy and/or evidence self-knowledge. Models of student performance and clearly defined criteria (i.e.: rubrics) are provided to all students in advance of starting work on the unit task.

Stage III: Designing Learning Activities: Instructional tasks, activities, and experiences are aligned with stages one and two so that the desired results are obtained based on the identified evidence or assessment tasks. Instructional activities and strategies are considered only once stages one and two have been clearly explicated. Therefore, congruence among all three stages can be ensured and teachers can make wise instructional choices.

At the curricular level, these three stages are best realized as a fusion of research, best practices, shared and sustained inquiry, consensus building, and initiative that involves all stakeholders. In this design, administrators are instructional leaders who enable the alignment between the curriculum and other key initiatives in their district or schools. These leaders demonstrate a clear purpose and direction for the curriculum within their school or district by providing support for implementation, opportunities for revision through sustained and consistent professional development, initiating action research activities, and collecting and evaluating materials to ensure alignment with the desired results. Intrinsic to the success of curriculum is to show how it aligns with the overarching goals of the district, how the document relates to district, state, or national standards, what a high quality educational program looks like, and what excellent teaching and learning looks like. Within education, success of the educational program is realized through this blend of commitment and organizational direction.

INTENT OF THE GUIDE

This guide is intended to provide teachers with course objectives and possible activities, as well as assist the teacher in planning and delivering instruction in accordance with the New Jersey Core Curriculum Content Standards. The guide is not intended to restrict or limit the teacher's resources or individual instruction techniques. It is expected that the teacher will reflectively adjust and modify instruction and units during the course of normal lessons depending on the varying needs of the class, provided such modified instruction attends to the objectives and essential questions outlined below.

N.J.A.C. 6A:8-3.1 Required Curriculum Components

Code Language	Evident in Curriculum YES/NO	Comments
Interdisciplinary Connections	**Yes**	**Via lab activities. STEM units in development 1 per marking period**
A pacing guide	**Yes**	**By Unit approximately 2-4 units per marking period**
A list of core instructional materials, including various levels of text at each grade level	**Yes**	**Suggested Activities Labs**
Benchmark assessments	**Yes**	**Teacher-developed and common via pre/post and benchmark assessments**
Modifications for special education students, for ELLs in accordance with N.J.A.C. 6A:15, and for gifted students. (As appropriate) – See Appendix A	**Yes**	**As directed by student's Individual Education Plan**

Unit Name: Chemistry and Matter **Time Frame:** 2 weeks (6-8 lecture days)

Author: Egg Harbor Township High School Science Department

UNIT

Subject: General Chemistry **Country:** USA

Course/Grade: 10-12 **State/Group:** NJ

School: Egg Harbor Township High School

UNIT SUMMARY

The purpose of this unit is to introduce students to Chemistry and investigate the different properties of matter. Students will learn to distinguish different classifications of matter and relate their specific properties to their structure and use in everyday life.

UNIT RESOURCES

- Textbook- Glencoe Chemistry 2005
- Glencoe Work books
- Lab Manuals and materials

Internet Resource Links:

- Discovery: www.unitedstreaming.com
- NBC Learn Videos: www.nbclearn.com
- eLibrary science: http://science.bigchalk.com/sciweb/science/do/search
- Online textbook: Glencoe Chemistry
- Web simulators: www.pHET.colorado.edu
- Web Video Clips: www.Learning4mastery.com (Flipped Learning)

STAGE ONE

GOALS AND STANDARDS

HS-PS1-1: Use a model to predict the relationships between systems or between components of a system.

HS-PS1-8: Develop a model based on evidence to illustrate the relationships between systems or

between components of a system.
WHST.9-12.9: Draw evidence from informational texts to support analysis, reflection, and research.

HS-PS2-6: Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.

HS-PS2-6: Apply scientific principles and evidence to provide an explanation of phenomena and solve design problems, taking into account possible unanticipated effects.

HS-PS1-2: Construct and revise an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, models, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future.

ENDURING UNDERSTANDINGS

- Chemistry explains the natural world.
- Properties can be used to classify, identify, separate matter, and explain structure and function.
- Matter has characteristic properties that are relate to the structure and function of the matter.
- Solving problems requires an appreciation of the big picture.

ESSENTIAL QUESTIONS

- Why is important to study many subjects in school? (1)
- Why is it important to study chemistry? (1)
- Why is it useful to learn problem solving skills? (1)
- How do chemists solve problems? (1)
- What properties are used to describe matter? (2)
- How can matter change its form? (2)

KNOWLEDGE AND SKILLS

- Explain why the scope of chemistry is so vast. (1)
- Identify five traditional areas of study in chemistry. (1)
- Identify the central themes of chemistry (1)

- Describe the steps in the scientific method. (1)
- Evaluate the difference between a scientific law and a theory. (1)
- Explain why all samples of a substance have the same intensive property. (2)
- Classify physical changes (2)
- Explain how mixtures are classified (2)
- Describe how mixtures can be separated (2)
- Explain the difference between and element and a compound (2)
- Distinguish between a substance and a mixture (2)

STAGE TWO

PERFORMANCE TASKS

- Laboratory investigations within small groups
- Constructed response
- Graphic organizers or models
- Do nows and/or exit slips
- Individual, small, and large group work
- Homework
- Guided practice

OTHER EVIDENCE

- Common assessment quiz
- Common assessment chapter test
- Review Activity

STAGE THREE

LEARNING PLAN

- Flashcards and/or drill and practice

- Power point presentations
- Lecture with note taking or guided notes
- Whole and small group discussions
- Laboratory groups
- Inquiry based activities with reflective discussion
- Online models and simulators

Student progress will be measured by formative and summative assessments. To maximize student understanding current and cumulative topics will be assessed weekly.

This unit is sequenced to begin with an informal assessment of prior knowledge of topics within the unit and determine any misconceptions. Students will then build small concrete blocks of information pertinent to mastery of this unit. Finally, students will be asked to use this information to evaluate higher level problems. This unit will end with a formal assessment common to all general students.

Unit Name: Atomic Theory and Electrons **Time Frame:** 2 Weeks (8 lecture days)

Author: Egg Harbor Township High School Science Department

UNIT

Subject: General Chemistry **Country:** USA

Course/Grade: 10-12 **State/Group:** NJ

School: Egg Harbor Township High School

UNIT SUMMARY

The goal of this unit is to introduce students to the structure of the atom and the field forces associated with the charges of subatomic particles. Different atomic theories will be covered as well as the experiments that lead to the theories behind subatomic structure. Law of energy and mass will be related to atoms and macroscopic objects.

UNIT RESOURCES

- Textbook- Glencoe Chemistry 2005
- Glencoe Work books
- Lab Manuals and materials

Internet Resource Links:

- Discovery: www.unitedstreaming.com
- NBC Learn Videos: www.nbclearn.com
- eLibrary science: http://science.bigchalk.com/sciweb/science/do/search
- Online textbook: Glencoe Chemistry
- Web simulators: www.pHET.colorado.edu
- Web Video Clips: www.Learning4mastery.com (Flipped Learning)

STAGE ONE

GOALS AND STANDARDS

HS-PS1-1: Use a model to predict the relationships between systems or between components of a system.
HS-PS1-8: Develop a model based on evidence to illustrate the relationships between systems or between components of a system.

WHST.9-12.9: Draw evidence from informational texts to support analysis, reflection, and research.

HS-PS2-6: Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.

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 motions 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 resul ts in a more uniform energy distribution among the components in the system (second law of ther modynamics).

PS3.B: Conservation of Energy and Energy Transfer Conservation of energy means that the total change of energy in any system is always equal to the total energy transferred into or out of the system.

HS- PS3-3:
Changes of energy and matter in a system can be described in terms of energy and matter flows into, out of, and within that system.

HS-PS2-6: Apply scientific principles and evidence to provide an explanation of phenomena and solve design problems, taking into account possible unanticipated effects.

HS-PS1-2: Construct and revise an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, models, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future.

ENDURING UNDERSTANDINGS

- The modern model of the atom has evolved over a long period of time through the work of many scientists.
- All matter is made of atoms.
- The majority of the mass of an atom is in the nucleus.
- The majority of the volume of an atom is empty space occupied by electrons.
- Subatomic particles each have their own charge, giving macroscopic objects a potential for net charge.
- Net electric charge leads to a magnetic field that can be observed with interaction.

ESSENTIAL QUESTIONS

- What components make up an atom?

- Why do you think it is important to understand the structure of an atom?
- How are atoms of one element different from atoms of another?
- Can you predict ways that one atom might differ from another atom?
- How do you think atoms will gain or release energy?

KNOWLEDGE AND SKILLS

- Explain how Democritus and John Dalton describe atoms
- Identify and describe the three types of subatomic particles
- Describe the structure of an atom using modern atomic theory
- Explain what makes one element different than another.
- Explain how isotopes of the same element differ
- Calculate the average atomic mass of an element
- Revise the atomic model
- Describe what Bohr proposed in his model of the atom
- Explain how sublevel of principle energy levels differ
- Explain how ions form

STAGE TWO

PERFORMANCE TASKS

- Laboratory investigations within small groups
- Constructed response
- Graphic organizers or models
- Do nows and/or exit slips
- Individual, small, and large group work
- Homework
- Guided practice

OTHER EVIDENCE

- Common assessment quiz
- Common assessment chapter test
- Review Activity

STAGE THREE

LEARNING PLAN

- Flashcards and/or drill and practice
- Power point presentations
- Lecture with note taking or guided notes
- Whole and small group discussions
- Laboratory groups
- Inquiry based activities with reflective discussion
- Online models and simulators

Student progress will be measured by formative and summative assessments. To maximize student understanding current and cumulative topics will be assessed weekly.

This unit is sequenced to begin with an informal assessment of prior knowledge of topics within the unit and determine any misconceptions. Students will then build small concrete blocks of information pertinent to mastery of this unit. Finally, students will be asked to use this information to evaluate higher level problems. This unit will end with a formal assessment common to all general students.

Unit Name: Periodic Table **Time Frame:** 2 weeks (6-8 lecture days)

Author: Egg Harbor Township High School Science Department

UNIT

Subject: General Chemistry **Country:** USA

Course/Grade: 10-12 **State/Group:** NJ

School: Egg Harbor Township High School

UNIT SUMMARY

The goal of this unit is to introduce the periodic table to students and have them be able to predict different characteristics of the elements. Moving through the groups, students will be given examples of different compounds containing elements within that group and commercial uses for those compounds. Students will also cover basic periodic table skills needed for medical field majors in college.

UNIT RESOURCES

- Textbook- Glencoe Chemistry 2005
- Glencoe Work books
- Lab Manuals and materials

Internet Resource Links:

- Discovery: www.unitedstreaming.com
- NBC Learn Videos: www.nbclearn.com
- eLibrary science: http://science.bigchalk.com/sciweb/science/do/search
- Online textbook: Glencoe Chemistry
- Web simulators: www.pHET.colorado.edu
- Web Video Clips: www.Learning4mastery.com (Flipped Learning)

STAGE ONE

GOALS AND STANDARDS

HS-PS1-1: Use a model to predict the relationships between systems or between components of a system.
HS-PS1-8: Develop a model based on evidence to illustrate the relationships between systems or between components of a system.
WHST.9-12.9: Draw evidence from informational texts to support analysis, reflection, and research.

HS-PS2-6: Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.

HS-PS2-6: Apply scientific principles and evidence to provide an explanation of phenomena and solve design problems, taking into account possible unanticipated effects.

HS-PS1-2: Construct and revise an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, models, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future.

ENDURING UNDERSTANDINGS

- The Periodic Table is a patterned system of organized groups of related elements.
- Manipulation and graphing data help to recognize and identify patterns.
- Understanding of regularities and patterns in the periodic table allows for predictions of interactions among the elements.
- An atom's electron configuration determines who it interacts with to form bonds.

ESSENTIAL QUESTIONS

- What are some ways that elements are different from one another?
- What information does the periodic table provide?
- How can periodic trends be explained?

KNOWLEDGE AND SKILLS

- Explain how chemist began to organize known and unknown elements
- Describe how Mendeleev organized his periodic table
- Explain how the modern periodic table is organized
- Identify the three broad classes of elements
- Classify elements according to their electron configuration
- Describe and explain different trends on the periodic table

STAGE TWO

PERFORMANCE TASKS

- Laboratory investigations within small groups
- Constructed response
- Graphic organizers or models
- Do nows and/or exit slips
- Individual, small, and large group work
- Homework
- Guided practice

OTHER EVIDENCE

- Common assessment quiz
- Common assessment chapter test
- Review Activity

STAGE THREE

LEARNING PLAN

- Flashcards and/or drill and practice
- Power point presentations
- Lecture with note taking or guided notes
- Whole and small group discussions
- Laboratory groups
- Inquiry based activities with reflective discussion
- Online models and simulators

Student progress will be measured by formative and summative assessments. To maximize student understanding current and cumulative topics will be assessed weekly.

This unit is sequenced to begin with an informal assessment of prior knowledge of topics within the unit and determine any misconceptions. Students will then build small concrete blocks of information pertinent to mastery of this unit. Finally, students will be asked to use this information to evaluate higher level problems. This unit will end with a formal assessment common to all general students.

Unit Name: Scientific Measurements **Time Frame:** 3 weeks (11-12 lecture days)

Author: Egg Harbor Township High School Science Department

UNIT

Subject: General Chemistry **Country:** USA

Course/Grade: 10-12 **State/Group:** NJ

School: Egg Harbor Township High School

UNIT SUMMARY

The purpose of this unit is to introduce students to scientific measurement. Students will learn the difference between accuracy and precision, how to make and read measurements in English and SI units, the density formula and how to make conversions using dimensional analysis. Students will also cover how to use significant figures.

UNIT RESOURCES

- Textbook- Glencoe Chemistry 2005
- Glencoe Work books
- Lab Manuals and materials

Internet Resource Links:

- Discovery: www.unitedstreaming.com
- NBC Learn Videos: www.nbclearn.com
- eLibrary science: http://science.bigchalk.com/sciweb/science/do/search
- Online textbook: Glencoe Chemistry
- Web simulators: www.pHET.colorado.edu
- Web Video Clips: www.Learning4mastery.com (Flipped Learning)

STAGE ONE

GOALS AND STANDARDS

HS-PS1-1: Use a model to predict the relationships between systems or between components of a system.
HS-PS1-8: Develop a model based on evidence to illustrate the relationships between systems or between components of a system.

WHST.9-12.9: Draw evidence from informational texts to support analysis, reflection, and research.

HS-PS2-6: Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes. Plan and conduct an investigation individually and collaboratively to produce data to serve as the basis for evidence, and in the design: decide on types, how much, and accuracy of data needed to produce reliable measurements and consider limitations on the precision of the data (e.g., number of trials, cost, risk, time), and refine the design accordingly.

HS-PS2-6: Apply scientific principles and evidence to provide an explanation of phenomena and solve design problems, taking into account possible unanticipated effects.

HS-PS1-2: Construct and revise an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, models, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future.

ENDURING UNDERSTANDINGS

- Measurements are not exact.
- Significant Figures identify how accurate a measurement is.
- Dimensional Analysis is a useful tool.

ESSENTIAL QUESTIONS

- When you make a measurement, what are some possible sources of uncertainty?
- How do scientists express the degree of uncertainty in their measurements?
- How is dimensional analysis used to solve problems?

KNOWLEDGE AND SKILLS

- Express numbers in scientific notation
- Evaluate accuracy and precision
- Explain why measurements must be reported to the correct number of significant figures
- Demonstrate why metric units are easy to use
- Calculate the density of a substance

- Explain the process when using a conversion factor
- Describe the type of problems that use dimensional analysis

STAGE TWO

PERFORMANCE TASKS

- Laboratory investigations within small groups
- Constructed response
- Graphic organizers or models
- Do nows and/or exit slips
- Individual, small, and large group work
- Homework
- Guided practice

OTHER EVIDENCE

- Common assessment quiz
- Common assessment chapter test
- Review Activity

STAGE THREE

LEARNING PLAN

- Flashcards and/or drill and practice
- Power point presentations
- Lecture with note taking or guided notes
- Whole and small group discussions

- Laboratory groups
- Inquiry based activities with reflective discussion
- Online models and simulators

Student progress will be measured by formative and summative assessments. To maximize student understanding current and cumulative topics will be assessed weekly.

This unit is sequenced to begin with an informal assessment of prior knowledge of topics within the unit and determine any misconceptions. Students will then build small concrete blocks of information pertinent to mastery of this unit. Finally, students will be asked to use this information to evaluate higher level problems. This unit will end with a formal assessment common to all general students.

Unit Name: Chemical Quantities **Time Frame:** 3 weeks (12 lecture days)

Author: Egg Harbor Township High School Science Department

UNIT

Subject: General Chemistry **Country:** USA

Course/Grade: 10-12 **State/Group:** NJ

School: Egg Harbor Township High School

UNIT SUMMARY

The purpose of this unit is to introduce the mole and use it to calculate chemical quantities. Students will use the mole to perform conversions between mass, particles, moles and volume. Students will use actual measurements of elements and compounds to perform conversions and have a visual of the quantities used in class.

UNIT RESOURCES

- Textbook- Glencoe Chemistry 2005
- Glencoe Work books
- Lab Manuals and materials

Internet Resource Links:

- Discovery: www.unitedstreaming.com
- NBC Learn Videos: www.nbclearn.com
- eLibrary science: http://science.bigchalk.com/sciweb/science/do/search
- Online textbook: Glencoe Chemistry
- Web simulators: www.pHET.colorado.edu
- Web Video Clips: www.Learning4mastery.com (Flipped Learning)

STAGE ONE

GOALS AND STANDARDS

HS-PS1-1: Use a model to predict the relationships between systems or between components of a system.
HS-PS1-8: Develop a model based on evidence to illustrate the relationships between systems or

between components of a system.
WHST.9-12.9: Draw evidence from informational texts to support analysis, reflection, and research.

HS-PS2-6: Apply scientific principles and evidence to provide an explanation of phenomena and solve design problems, taking into account possible unanticipated effects.

HS-PS1-2: Construct and revise an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, models, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future.

HS-PS1-6 Refine a solution to a complex real-world problem, based on scientific knowledge, student-generated sources of evidence, prioritized criteria, and tradeoff considerations.

ENDURING UNDERSTANDINGS

- The mole is a grouping similar to a dozen
- Dimensional analyses can be used to convert between given quantities
- Empirical formulas are simplified molecular formulas

ESSENTIAL QUESTIONS

- Why is the mole an important measurement in chemistry?
- What information does a molecular formula tell you?
- Why is it important to be able to convert units?

KNOWLEDGE AND SKILLS

- Explain how chemist count the number of atoms molecules, or formula units of a substance
- Determine the molar mass of an element and a compound
- Describe the process to convert mass to moles; and moles to mass.
- Put into action converting between moles, molecules, and atoms
- Calculate the percent by mass of element in a compound

STAGE TWO

PERFORMANCE TASKS

- Laboratory investigations within small groups
- Constructed response
- Graphic organizers or models
- Do nows and/or exit slips
- Individual, small, and large group work
- Homework
- Guided practice

OTHER EVIDENCE

- Common assessment quiz
- Common assessment chapter test
- Review Activity

STAGE THREE

LEARNING PLAN

- Flashcards and/or drill and practice
- Power point presentations
- Lecture with note taking or guided notes
- Whole and small group discussions
- Laboratory groups
- Inquiry based activities with reflective discussion
- Online models and simulators

Student progress will be measured by formative and summative assessments. To maximize student understanding current and cumulative topics will be assessed weekly.

This unit is sequenced to begin with an informal assessment of prior knowledge of topics within the unit and determine any misconceptions. Students will then build small concrete blocks of information pertinent to mastery of this unit. Finally, students will be asked to use this information to evaluate higher level problems. This unit will end with a formal assessment common to all general students.

Unit Name: Ionic & Molecular Compounds and Nomenclature

Time Frame: 3 Weeks (12 lecture days)

Author: Egg Harbor Township High School Science Department

UNIT

Subject: General Chemistry **Country:** USA

Course/Grade: 10-12 **State/Group:** NJ

School: Egg Harbor Township High School

UNIT SUMMARY

The purpose of this unit is to introduce students to bonding. This unit will explain the difference between an ionic bond and a molecular bond. This units will also explain how to name simple compounds. Students should be able determine the type of bonding made between atoms depending on the type of atoms involved in the compound.

UNIT RESOURCES

- Textbook- Glencoe Chemistry 2005
- Glencoe Work books
- Lab Manuals and materials

Internet Resource Links:

- Discovery: www.unitedstreaming.com
- NBC Learn Videos: www.nbclearn.com
- eLibrary science: http://science.bigchalk.com/sciweb/science/do/search
- Online textbook: Glencoe Chemistry
- Web simulators: www.pHET.colorado.edu
- Web Video Clips: www.Learning4mastery.com (Flipped Learning)

STAGE ONE

GOALS AND STANDARDS

HS-PS1-1: Use a model to predict the relationships between systems or between components of a system.

HS-PS1-8: Develop a model based on evidence to illustrate the relationships between systems or between components of a system.

WHST.9-12.9: Draw evidence from informational texts to support analysis, reflection, and research.

HS-PS2-6: Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.

HS-PS2-6: Apply scientific principles and evidence to provide an explanation of phenomena and solve design problems, taking into account possible unanticipated effects.

HS-PS1-2: Construct and revise an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, models, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future.

ENDURING UNDERSTANDINGS

- The octet rule is used to determine how atoms bond covalently with one another by sharing electrons.
- Lewis dot structures are drawn to help predict shapes of molecules.
- Electronegativity can determine the polarity of atoms, their type of bond, and the strength of intermolecular forces.
- The electron domain placement determines the shapes and therefore the properties of molecules.

ESSENTIAL QUESTIONS

- What is an ion?
- How does the periodic table help you determine the names and formulas of ions and compounds?
- What is the difference between an ionic and a molecular compound?
- Other than gaining or losing electrons, how do atoms attain noble gas configuration?
- How is the bonding of molecular compounds different from ionic compounds?
- What factors affect molecular properties?
- How does the charge of an atom change if it gains or loses an electron?
- How do ionic compounds form?
- How does metallic bonding affect the properties of metals?

KNOWLEDGE AND SKILLS

- Determine the number of valence electrons for an element using the periodic table
- Identify the trend whether an element is losing or gaining electrons
- Describe how cations and anions form
- Explain the electrical charge of an ionic compound
- Describe three properties of ionic compounds
- Model the valence electrons of a metal atom
- Explain the importance of metal alloys
- Identify the information a molecular compound provides
- Explain the result of electron sharing in a covalent bond
- Relate the strength of bonds between ionic and covalent bonds
- Calculate electronegativity differences for molecular compounds
- Evaluate whether the molecule is polar or non-polar

STAGE TWO

PERFORMANCE TASKS

- Laboratory investigations within small groups
- Constructed response
- Graphic organizers or models
- Do nows and/or exit slips
- Individual, small, and large group work
- Homework
- Guided practice

OTHER EVIDENCE

- Common assessment quiz
- Common assessment chapter test
- Review Activity

STAGE THREE

LEARNING PLAN

- Flashcards and/or drill and practice
- Power point presentations
- Lecture with note taking or guided notes
- Whole and small group discussions
- Laboratory groups
- Inquiry based activities with reflective discussion
- Online models and simulators

Student progress will be measured by formative and summative assessments. To maximize student understanding current and cumulative topics will be assessed weekly.

This unit is sequenced to begin with an informal assessment of prior knowledge of topics within the unit and determine any misconceptions. Students will then build small concrete blocks of information pertinent to mastery of this unit. Finally, students will be asked to use this information to evaluate higher level problems. This unit will end with a formal assessment common to all general students.

Unit Name: Chemical Reactions **Time Frame:** 3 weeks (12 lecture days)

Author: Egg Harbor Township High School Science Department

UNIT

Subject: General Chemistry **Country:** USA

Course/Grade: 10-12 **State/Group:** NJ

School: Egg Harbor Township High School

UNIT SUMMARY

The goal of this unit is to give students a better scientific understanding of how visual changes in matter source from atomic interaction.

UNIT RESOURCES

- Textbook- Glencoe Chemistry 2005
- Glencoe Work books
- Lab Manuals and materials

Internet Resource Links:

- Discovery: www.unitedstreaming.com
- NBC Learn Videos: www.nbclearn.com
- eLibrary science: http://science.bigchalk.com/sciweb/science/do/search
- Online textbook: Glencoe Chemistry
- Web simulators: www.pHET.colorado.edu
- Web Video Clips: www.Learning4mastery.com (Flipped Learning)

STAGE ONE

GOALS AND STANDARDS

HS-PS1-1: Use a model to predict the relationships between systems or between components of a system.

HS-PS1-8: Develop a model based on evidence to illustrate the relationships between systems or between components of a system.

WHST.9-12.9: Draw evidence from informational texts to support analysis, reflection, and research.

HS-PS2-6: Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.

HS-PS2-6: Apply scientific principles and evidence to provide an explanation of phenomena and solve design problems, taking into account possible unanticipated effects.

HS-PS1-2: Construct and revise an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, models, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future.

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

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.

ENDURING UNDERSTANDINGS

- Chemical formulas can provide much information about the amount of chemicals that can be used or produced during a reaction.
- Quantities of all reactants are not always completely consumed.
- Not every combination of reactants will produce a chemical reaction.

ESSENTIAL QUESTIONS

- What does the law of conservation of mass mean?
- How do chemical reactions obey the law of conservation of mass?
- What would this mean for a chemical reaction?
- How can you predict the products of a chemical reaction?

KNOWLEDGE AND SKILLS

- Show how to write a skeleton chemical reaction
- Describe the steps for writing and balancing a chemical equation

- Identify the 5 general types of reactions

STAGE TWO

PERFORMANCE TASKS

- Laboratory investigations within small groups
- Constructed response
- Graphic organizers or models
- Do nows and/or exit slips
- Individual, small, and large group work
- Homework
- Guided practice

OTHER EVIDENCE

- Common assessment quiz
- Common assessment chapter test
- Review Activity

STAGE THREE

LEARNING PLAN

- Flashcards and/or drill and practice
- Power point presentations
- Lecture with note taking or guided notes
- Whole and small group discussions
- Laboratory groups
- Inquiry based activities with reflective discussion

- Online models and simulators

Student progress will be measured by formative and summative assessments. To maximize student understanding current and cumulative topics will be assessed weekly.

This unit is sequenced to begin with an informal assessment of prior knowledge of topics within the unit and determine any misconceptions. Students will then build small concrete blocks of information pertinent to mastery of this unit. Finally, students will be asked to use this information to evaluate higher level problems. This unit will end with a formal assessment common to all general students.

Unit Name: States of Matter and Gas Laws **Time Frame:** 2 Weeks (8 lectures)

Author: Egg Harbor Township High School Science Department

UNIT

Subject: General Chemistry **Country:** USA

Course/Grade: 10-12 **State/Group:** NJ

School: Egg Harbor Township High School

UNIT SUMMARY

This unit will guide students through the properties of solids, liquids, and gases and how they change with pressure and temperature. General applications of solids, liquids, and gases will be discussed in certain real world conditions. The rest of the unit will focus on gases and how they behave under certain conditions.

UNIT RESOURCES

- Textbook- Glencoe Chemistry 2005
- Glencoe Work books
- Lab Manuals and materials

Internet Resource Links:

- Discovery: www.unitedstreaming.com
- NBC Learn Videos: www.nbclearn.com
- eLibrary science: http://science.bigchalk.com/sciweb/science/do/search
- Online textbook: Glencoe Chemistry
- Web simulators: www.pHET.colorado.edu
- Web Video Clips: www.Learning4mastery.com (Flipped Learning)

STAGE ONE

GOALS AND STANDARDS

HS-PS1-1: Use a model to predict the relationships between systems or between components of a system.

HS-PS1-8: Develop a model based on evidence to illustrate the relationships between systems or

between components of a system.
WHST.9-12.9: Draw evidence from informational texts to support analysis, reflection, and research.

HS-PS2-6: Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.

HS-PS2-6: Apply scientific principles and evidence to provide an explanation of phenomena and solve design problems, taking into account possible unanticipated effects.

HS-PS1-2: Construct and revise an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, models, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future.

ENDURING UNDERSTANDINGS

- Intermolecular forces affect the properties of all states of matter.
- Temperature affects the properties and behavior of matter.
- The hydrogen bonding in water accounts for its unique properties.
- The kinetic molecular theory can conceptually predict, analyze, and explain the properties of gases.
- The gas laws can predict, analyze and explain many everyday occurrences involving gases.
- Movement of particles within a substance dictate the state of that substance.

ESSENTIAL QUESTIONS

- Compared to solids and liquids, what is unique about gases?
- How do gases respond to changes in pressure, volume, and temperature?
- Why do you suppose we study ideal gases?
- Why is the ideal gas law useful even though ideal gases do not exist?

KNOWLEDGE AND SKILLS

- Explain why gases are easier to compress than solids or liquids
- Describe three factors that affect gas pressure

- Relate the total pressure to the partial pressures of gases contained in a mixture

STAGE TWO

PERFORMANCE TASKS

- Laboratory investigations within small groups
- Constructed response
- Graphic organizers or models
- Do nows and/or exit slips
- Individual, small, and large group work
- Homework
- Guided practice

OTHER EVIDENCE

- Common assessment quiz
- Common assessment chapter test
- Review Activity

STAGE THREE

LEARNING PLAN

- Flashcards and/or drill and practice
- Power point presentations
- Lecture with note taking or guided notes
- Whole and small group discussions
- Laboratory groups
- Inquiry based activities with reflective discussion

- Online models and simulators

Student progress will be measured by formative and summative assessments. To maximize student understanding current and cumulative topics will be assessed weekly.

This unit is sequenced to begin with an informal assessment of prior knowledge of topics within the unit and determine any misconceptions. Students will then build small concrete blocks of information pertinent to mastery of this unit. Finally, students will be asked to use this information to evaluate higher level problems. This unit will end with a formal assessment common to all general students.

Unit Name: Solutions **Time Frame:** 1-2 weeks (4 to 8 lectures)

Author: Egg Harbor Township High School Science Department

UNIT

Subject: General Chemistry **Country:** USA

Course/Grade: 10-12 **State/Group:** NJ

School: Egg Harbor Township High School

UNIT SUMMARY

The goal of this unit is to continue to explore reactivity of compounds mixed in water, which is commonly utilized when working in industry, bodily functioning, and commercial mass production. Students will be able to work measurement conversions to make solutions in lab with specific concentrations. Students will relate the solutions made in class with everyday solutions.

UNIT RESOURCES

- Textbook- Glencoe Chemistry 2005
- Glencoe Work books
- Lab Manuals and materials

Internet Resource Links:

- Discovery: www.unitedstreaming.com
- NBC Learn Videos: www.nbclearn.com
- eLibrary science: http://science.bigchalk.com/sciweb/science/do/search
- Online textbook: Glencoe Chemistry
- Web simulators: www.pHET.colorado.edu
- Web Video Clips: www.Learning4mastery.com (Flipped Learning)

STAGE ONE

GOALS AND STANDARDS

HS-PS1-1: Use a model to predict the relationships between systems or between components of a system.

HS-PS1-8: Develop a model based on evidence to illustrate the relationships between systems or between components of a system.
WHST.9-12.9: Draw evidence from informational texts to support analysis, reflection, and research.

HS-PS2-6: Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.

HS-PS2-6: Apply scientific principles and evidence to provide an explanation of phenomena and solve design problems, taking into account possible unanticipated effects.

HS-PS1-2: Construct and revise an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, models, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future.

ENDURING UNDERSTANDINGS

- Water is vital to life because of its unique properties.
- Solutions concentration can be described mathematically in a variety of terms.
- Adding solute to a pure solution will have an effect on the properties.

ESSENTIAL QUESTIONS

- In a solution of salt water, what are the solute and the solvent?
- Are parts of the solution chemically or physically combined?
- What properties are used to describe the nature of solutions?
- In what ways can you quantify the concentration of a solution?

KNOWLEDGE AND SKILLS

- Identify factors that affect how fast a substance dissolves
- Describe equilibrium with a saturated solution
- Describe factors that affect the solubility of a substance

- Calculate the molarity of a solution
- Compare and contrast a concentrated and a dilute solution
- Put into action the dilution equation (M1V1=M2V2)

STAGE TWO

PERFORMANCE TASKS

- Laboratory investigations within small groups
- Constructed response
- Graphic organizers or models
- Do nows and/or exit slips
- Individual, small, and large group work
- Homework
- Guided practice

OTHER EVIDENCE

- Common assessment quiz
- Common assessment chapter test
- Review Activity

STAGE THREE

LEARNING PLAN

- Flashcards and/or drill and practice
- Power point presentations
- Lecture with note taking or guided notes
- Whole and small group discussions

- Laboratory groups
- Inquiry based activities with reflective discussion
- Online models and simulators

Student progress will be measured by formative and summative assessments. To maximize student understanding current and cumulative topics will be assessed weekly.

This unit is sequenced to begin with an informal assessment of prior knowledge of topics within the unit and determine any misconceptions. Students will then build small concrete blocks of information pertinent to mastery of this unit. Finally, students will be asked to use this information to evaluate higher level problems. This unit will end with a formal assessment common to all general students.

Unit Name: Acid, Bases, and pH **Time Frame:** 2-3 weeks (8-12 lectures)

Author: Egg Harbor Township High School Science Department

UNIT

Subject: General Chemistry **Country:** USA

Course/Grade: 10-12 **State/Group:** NJ

School: Egg Harbor Township High School

UNIT SUMMARY

The goal of this unit is to exposed students to the fundamentals of acids and bases and how they affect the world around us. Students will touch upon how different enzymes and bacteria within the body function at optimal pH. Students will also investigate pH levels of different products they are in contact with on a daily basis and relate it to the theories behind pH.

UNIT RESOURCES

- Textbook- Glencoe Chemistry 2005
- Glencoe Work books
- Lab Manuals and materials

Internet Resource Links:

- Discovery: www.unitedstreaming.com
- NBC Learn Videos: www.nbclearn.com
- eLibrary science: http://science.bigchalk.com/sciweb/science/do/search
- Online textbook: Glencoe Chemistry
- Web simulators: www.pHET.colorado.edu
- Web Video Clips: www.Learning4mastery.com (Flipped Learning)

STAGE ONE

GOALS AND STANDARDS

5.1.P.B.2: Use basic science terms and topic-related science vocabulary.

ENDURING UNDERSTANDINGS

- Acids and bases play a major role in our everyday lives.
- Acid-Base reactions do not always produce neutral results.
- It is possible for a chemical system to resist a pH change.

ESSENTIAL QUESTIONS

- What are some properties of acids?
- What are the different ways chemist define acids and bases?
- What does pH of a solution mean?
- How do chemists use acid/base reactions?

KNOWLEDGE AND SKILLS

- Define acids and bases according to the Arrhenius, Bronsted-Lowry, and Lewis definitions
- Describe the relationship between [OH-] and [H+] in a solution
- Compare and contrast between strong/weak acids/bases.
- Classify a solution as acidic or basic using its [OH-] or [H+]
- Compute the pH for given solutions and determine whether acid, base, or neutral
- Identify the products of an acid/base neutralization

STAGE TWO

PERFORMANCE TASKS

- Laboratory investigations within small groups
- Constructed response
- Graphic organizers or models
- Do nows and/or exit slips

- Individual, small, and large group work
- Homework
- Guided practice

OTHER EVIDENCE

- Common assessment quiz
- Common assessment chapter test
- Review Activity

STAGE THREE

LEARNING PLAN

- Flashcards and/or drill and practice
- Power point presentations
- Lecture with note taking or guided notes
- Whole and small group discussions
- Laboratory groups
- Inquiry based activities with reflective discussion
- Online models and simulators

Student progress will be measured by formative and summative assessments. To maximize student understanding current and cumulative topics will be assessed weekly.

This unit is sequenced to begin with an informal assessment of prior knowledge of topics within the unit and determine any misconceptions. Students will then build small concrete blocks of information pertinent to mastery of this unit. Finally, students will be asked to use this information to evaluate higher level problems. This unit will end with a formal assessment common to all general students.

Unit Name: Special Topics: Chemical Application **Time Frame:** 3 weeks (12 Lectures)

Author: Egg Harbor Township High School Science Department

UNIT

Subject: General Chemistry **Country:** USA

Course/Grade: 10-12 **State/Group:** NJ

School: Egg Harbor Township High School

UNIT SUMMARY

Within this unit students will learn the flow of energy within a chemical reaction system and its surroundings. Building off of this understanding, students will then begin to calculate specific heat of various substances and compare it to known properties. The use of calorimeter will be used to demonstrate the flow of energy and allow students to complete enthalpy, entropy, Hess' law, and Gibbs free energy equations. Lastly, students will use their knowledge of water's properties to complete a molar heat of fusion diagram.

UNIT RESOURCES

- Textbook- Glencoe Chemistry 2005
- Glencoe Work books
- Lab Manuals and materials

Internet Resource Links:

- Discovery: www.unitedstreaming.com
- NBC Learn Videos: www.nbclearn.com
- eLibrary science: http://science.bigchalk.com/sciweb/science/do/search
- Online textbook: Glencoe Chemistry
- Web simulators: www.pHET.colorado.edu
- Web Video Clips: www.Learning4mastery.com (Flipped Learning)

STAGE ONE

GOALS AND STANDARDS

HS-PS1-1: Use a model to predict the relationships between systems or between components of a system.

HS-PS1-8: Develop a model based on evidence to illustrate the relationships between systems or between components of a system.
WHST.9-12.9: Draw evidence from informational texts to support analysis, reflection, and research.

HS-PS2-6: Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.

HS-PS2-6: Apply scientific principles and evidence to provide an explanation of phenomena and solve design problems, taking into account possible unanticipated effects.

HS-PS1-2: Construct and revise an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, models, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future.

ENDURING UNDERSTANDINGS

- Medication and treatment for illness depends on chemistry of active ingredients.
- Current advances in technology utilize the characteristics of matter to improve efficiency of machines while decreasing the amount of waste produced.
- Illegal substances greatly alter the natural chemical balance of neurotransmitters in the body resulting in impaired functioning.
- Past misconceptions of medical use of elements that have led to serious injury and death has allowed society to pass regulation laws of these substances.

ESSENTIAL QUESTIONS

- What type of reactions are utilized in nuclear power plants and energy generation as a whole?
- What advanced chemistry concepts are involved in everyday life?
- How is chemistry used for drug/body analyses?
- How is chemistry used in warfare?

KNOWLEDGE AND SKILLS

- Explain how different kitchen applications use chemistry.
- Define a hydrogen fuel cell and how it works.
- Explain how half-life can help determine the age of a sample.
- Explain how medical imaging works.
- Describe how to determine if an element is radioactive.
- Compare the technology used pre and post 1960 in warfare and how chemistry is involved.
- Explain how chemistry is related to the mental and psychological wellbeing of individuals.

STAGE TWO

PERFORMANCE TASKS

- Laboratory investigations within small groups
- Constructed response
- Graphic organizers or models
- Do nows and/or exit slips
- Individual, small, and large group work
- Homework
- Guided practice

OTHER EVIDENCE

- Common assessment quiz
- Common assessment chapter test

- Review Activity

STAGE THREE

LEARNING PLAN

- Flashcards and/or drill and practice
- Power point presentations
- Lecture with note taking or guided notes
- Whole and small group discussions
- Laboratory groups
- Inquiry based activities with reflective discussion
- Online models and simulators

Student progress will be measured by formative and summative assessments. To maximize student understanding current and cumulative topics will be assessed weekly.

This unit is sequenced to begin with an informal assessment of prior knowledge of topics within the unit and determine any misconceptions. Students will then build small concrete blocks of information pertinent to mastery of this unit. Finally, students will be asked to use this information to evaluate higher level problems. This unit will end with a formal assessment common to all general students.

Unit Name: Introduction to Biochemistry **Time Frame:** 2 weeks (8 lectures)

Author: Egg Harbor Township High School Science Department

UNIT

Subject: General Chemistry **Country:** USA

Course/Grade: 10-12 **State/Group:** NJ

School: Egg Harbor Township High School

UNIT SUMMARY

The purpose of this unit is to cover the fundamentals of the chemistry of life. This unit will cover basic topics of biochemistry including major macromolecules, enzymes and their functions, chemical concepts behind major physiological functions of the body, and medications. This unit will also focus on all chemistry topics needed for students going into the medical field as pre-professional majors.

UNIT RESOURCES

- Textbook- Glencoe Chemistry 2005
- Glencoe Work books
- Lab Manuals and materials

Internet Resource Links:

- Discovery: www.unitedstreaming.com
- NBC Learn Videos: www.nbclearn.com
- eLibrary science: http://science.bigchalk.com/sciweb/science/do/search
- Online textbook: Glencoe Chemistry
- Web simulators: www.pHET.colorado.edu
- Web Video Clips: www.Learning4mastery.com (Flipped Learning)

STAGE ONE

GOALS AND STANDARDS

HS-PS1-1: Use a model to predict the relationships between systems or between components of a system.

HS-PS1-8: Develop a model based on evidence to illustrate the relationships between systems or between components of a system.
WHST.9-12.9: Draw evidence from informational texts to support analysis, reflection, and research.

HS-PS2-6: Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.

HS-PS2-6: Apply scientific principles and evidence to provide an explanation of phenomena and solve design problems, taking into account possible unanticipated effects.

HS-PS1-2: Construct and revise an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, models, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future.

ENDURING UNDERSTANDINGS

- The major macromolecules essential to life are proteins, carbohydrates, lipids, and nucleic acids.
- Life depends on catalyzed reactions by enzymes.
- The body depends on electrical forces generated by molecules and metal ions for proper operation.
- Pressure, temperature, and pH are all vital aspects of homeostasis.

ESSENTIAL QUESTIONS

- What are the major macromolecules of life?
- How do chemical reactions play a role in cells?
- How is electrical current developed by ions utilized within the body?
- How do chemicals control the function of the brain and body?
- How does research in chemistry help advance medication?
- What are the essential needs for human survival?

KNOWLEDGE AND SKILLS

- List and describe the biological macromolecules.
- Explain how enzymes function and their significance.

- Describe pH and how it relates to organ function.
- Explain how ions play a role in the nervous system and muscle contraction

STAGE TWO

PERFORMANCE TASKS

- Laboratory investigations within small groups
- Constructed response
- Graphic organizers or models
- Do nows and/or exit slips
- Individual, small, and large group work
- Homework
- Guided practice

OTHER EVIDENCE

- Common assessment quiz
- Common assessment chapter test
- Review Activity

STAGE THREE

LEARNING PLAN

- Flashcards and/or drill and practice
- Power point presentations
- Lecture with note taking or guided notes
- Whole and small group discussions
- Laboratory groups
- Inquiry based activities with reflective discussion

- Online models and simulators

Student progress will be measured by formative and summative assessments. To maximize student understanding current and cumulative topics will be assessed weekly.

This unit is sequenced to begin with an informal assessment of prior knowledge of topics within the unit and determine any misconceptions. Students will then build small concrete blocks of information pertinent to mastery of this unit. Finally, students will be asked to use this information to evaluate higher-level problems. This unit will end with a formal assessment common to all general students.

Curriculum Resources - Differentiated Instruction

Special Education Interventions in General Education

Visual Supports
Extended time to complete tests and assignments
Graphic Organizers
Mnemonic tricks to improve memory
Study guides
Use agenda book for assignments
Provide a posted daily schedule
Use of classroom behavior management system
Use prompts and model directions
Use task analysis to break down activities and lessons into each individual step needed to complete the task
Use concrete examples to teach concepts
Have student repeat/rephrase written directions
Heterogeneous grouping

Resources:

Do to Learn:
http://www.do2learn.com/

Sen Teacher:
http://www.senteacher.org/

Intervention Central:
http://www.interventioncentral.org/

Learning Ally:
https://www.learningally.org/

English Language Learners Interventions in Regular Education
Resources:

FABRIC - Learning Paradigm for ELLs (NJDOE)
www.nj.gov/education/bilingual/pd/**fabric**/**fabric**.pdf

Guide to Teaching ELL Students
http://www.colorincolorado.org/new-teaching-ells

Edutopia - Supporting English Language Learners
https://www.edutopia.org/blog/strategies-and-resources-supporting-ell-todd-finley

Reading Rockets
http://www.readingrockets.org/reading-topics/english-language-learners

Gifted and Talented Interventions in Regular Education
Resources:

Who are Gifted and Talented Students
http://www.npr.org/sections/ed/2015/09/28/443193523/who-are-the-gifted-and-talented-and-what-do-they-need

Hoagies Gifted Education Page
http://www.hoagiesgifted.org/programs.htm

21st Century Learning
Resources:

Partnership for 21st Century Learning
http://www.p21.org/

Career Ready Practices (NJDOE)
http://www.nj.gov/education/cte/hl/CRP.pdf