**The Georgia Department of Juvenile Justice**

**High School Physical Science**

**Units of Instruction Resource Manual**

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**Acknowledgements**

The Georgia Department of Juvenile Justice Department of Education would like to thank the many educators who have helped to create this High School Physical Science Units of Instruction Resource Manual. The educators have been particularly helpful in sharing their ideas and resources to ensure the completion and usefulness of this manual.

Students served by the DJJ require a special effort if they are to become contributing and participating members of their communities. Federal and state laws, regulations, and rules will mean nothing in the absence of professional commitment and dedication by every staff member.

The Georgia Department of Juvenile Justice is very proud of its school system. The school system is Georgia’s 181st and is accredited by the Southern Association of Colleges and Schools (SACS). The DJJ School System has been called exemplary by the US Department of Justice. This didn’t just happen by chance; rather it was the hard work of many teachers, clerks, instructors and administrators that earned DJJ these accolades and accreditations. The DJJ education programs operate well because of the dedicated staff. These dedicated professionals are the heart of our system.

These Content Area Units of Instruction were designed to serve as a much needed tool for delivering meaningful whole group instruction. In addition, this resource will serve as a supplement to the skills and knowledge provided by the Georgia Department of Juvenile Justice Curriculum Activity Packets (CAPs).

I would like to thank all the DJJ Teaching Staff, the Content Area Leadership Teams, Kimberly Harrison, DJJ Special Education/Curriculum Consultant and Martha Patton, Curriculum Director for initiating this project and seeing it through. Thank you all for your hard work and dedication to the youth we serve.

Sincerely yours,

James “Jack” Catrett, Ed.D.

Associate Superintendent

**Mission**

The mission of Department of Juvenile Justice Science Consortium (DJJSC) is to build a multiparty effort statewide to achieve continuous, systemic and sustainable improvements in the education system serving the Science students of the Department of Juvenile Justice (DJJ).

**Vision**

To achieve the mission of the DJJSC, members work collaboratively in examining the Georgia Performance Standards. These guidelines speak specifically to teachers being able to: deliver meaning content pertaining to the Characteristics of Science and its content standards across the Science units of instruction. The DJJSC will master and develop whole-group unit lessons built around Curriculum Activity Packets (CAPs), critique student work, and work as a team to solve the common challenges of teaching within DJJ. Additionally, the DJJSC jointly analyzes student test data in order to: develop strategies to eradicate common academic deficits among students, align curriculum, and create a coherent learning pathway across grade levels. The DJJSC also reviews research articles, attends workshops or courses, and invites consultants to assist in the acquisition of necessary knowledge and skills. Finally, DJJSC members observe one another in the classroom through focus walks.

**Introduction**

The High School Physical Science Units of Instruction Resource Manual is a tool that has been created to serve as a much needed tool for delivering meaningful whole group instruction. This manual is a supplement to the skills and knowledge provided by the Georgia Department of Juvenile Justice Curriculum Activity Packets (CAPs). It is imperative that our students learn to identify and investigate problems scientifically, and to work in cooperative learning groups. Best practices in education indicate that teachers should first model new skills for students. Next, teachers should provide opportunities for guided practice. Only then should teachers expect students to successfully complete an activity independently. The High School Physical Science Units of Instruction meets that challenge.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | | **The Georgia Department of Juvenile Justice**  **Office of Education**  **Direct Instruction Lesson Plan** | | |
| Teacher: | | | | |
| Subject:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Date:\_\_\_\_\_\_\_\_\_\_\_\_\_to­\_\_\_\_\_\_\_\_\_\_\_­­\_\_\_\_\_\_\_  Period  □ 1st  □ 2nd  □ 3rd  □ 4th  □ 5th  □ 6th | | | Students will engage in:  □ Independent activities □ pairing  □ Cooperative learning □ hands-on  □ Peer tutoring □ Visuals  □ technology integration □ Simulations  □ a project □ centers  □ lecture □ Other | |
| Essential Question(s):  Standards:  CAPs Covered:  Grade Level:\_\_\_\_ Unit:\_\_\_\_\_\_  RTI Tier for data collection: 2 or 3  Tier 2 Students:  Tier 3 Students: | | | | |
| **Time** | **Procedures Followed:** | | | **Material/Text** |
| \_\_\_\_\_\_\_  Minutes | Review of Previously Learned Material/Lesson Connections:  Recommended Time: 2 Minutes | | |  |
| \_\_\_\_\_\_\_  Minutes | Display the Georgia Performance Standard(s) (project on  blackboard via units of instruction located at  <http://thevillage411.weebly.com/units-of-instruction2.html>, or print on blackboard) Read the Georgia Performance Standard(s) aloud and explain it to your students. You can rephrase the Georgia Performance Standard to make sure your students understand it.  Display the Essential Question(s) (project on blackboard via units of instruction, or print on blackboard). Read the Essential Question (s) aloud and explain it to your students. You can rephrase the Essential Question (s) to make sure your students understand it.  Recommended Time: 2 Minutes | | |  |
| \_\_\_\_\_\_\_  Minutes | Introduce task by stating the purpose of today’s lesson.  Recommended Time: 2 Minutes | | |  |
| \_\_\_\_\_\_\_  Minutes | Engage students in conversation by asking open ended questions related to the essential question(s).  Recommended Time: 2 Minutes | | |  |
| \_\_\_\_\_\_\_  Minutes | Begin whole group instruction with corrective feedback:  Recommended Time: 10 Minutes | | |  |
| \_\_\_\_\_\_\_  Minutes | Lesson Review/Reteach:  Recommended Time: 2 Minutes | | |  |
| \_\_\_\_\_\_\_  Minutes | Independent Work CAPs:  Recommended Time: 30 Minutes | | |  |
| Teacher Reflections: | | | | |

The Instructional Rotation Matrix has been designed to assist science teachers in providing a balanced approach to utilizing the Science Units of Instruction across all grade levels on a rotating schedule.

|  |  |  |  |
| --- | --- | --- | --- |
| Monday | Tuesday | Wednesday | Thursday |
| 6th Grade Content  Middle School | 9th Grade Content  High School | 7th Grade Content  Middle School | 10th Grade Content  High School |
| 8th Grade Content  Middle School | 11th Grade Content  High School | 6th Grade Content  Middle School | 12th Grade Content  High School |
| 7th Grade Content  Middle School | 9th Grade Content  High School | 8th Grade Content  Middle School | 10th Grade Content  High School |
| 6th Grade Content  Middle School | 11th Grade Content  High School | 7th Grade Content  Middle School | 12th Grade Content  High School |

**Georgia Performance Standards**

**SCSh1. Students will evaluate the importance of curiosity, honesty, openness, and skepticism in science.**

a. Exhibit the above traits in their own scientific activities.

b. Recognize that different explanations often can be given for the same evidence.

c. Explain that further understanding of scientific problems relies on the design and execution of new experiments which may reinforce or weaken opposing explanations.

**SCSh2. Students will use standard safety practices for all classroom laboratory and field investigations.**

a. Follow correct procedures for use of scientific apparatus.

b. Demonstrate appropriate techniques in all laboratory situations.

c. Follow correct protocol for identifying and reporting safety problems and violations.

**SCSh3. Students will identify and investigate problems scientifically.**

a. Suggest reasonable hypotheses for identified problems.

b. Develop procedures for solving scientific problems.

c. Collect, organize and record appropriate data.

d. Graphically compare and analyze data points and/or summary statistics.

e. Develop reasonable conclusions based on data collected.

f. Evaluate whether conclusions are reasonable by reviewing the process and checking against other available information.

**SCSh4. Students will use tools and instruments for observing, measuring, and manipulating scientific equipment and materials.**

a. Develop and use systematic procedures for recording and organizing information.

b. Use technology to produce tables and graphs.

c. Use technology to develop, test, and revise experimental or mathematical models.

**SCSh5. Students will demonstrate the computation and estimation skills necessary for analyzing data and developing reasonable scientific explanations.**

a. Trace the source on any large disparity between estimated and calculated answers to problems.

b. Consider possible effects of measurement errors on calculations.

c. Recognize the relationship between accuracy and precision.

d. Express appropriate numbers of significant figures for calculated data, using scientific notation where appropriate.

e. Solve scientific problems by substituting quantitative values, using dimensional analysis, and/or simple algebraic formulas as appropriate.

**SCSh6. Students will communicate scientific investigations and information clearly.**

a. Write clear, coherent laboratory reports related to scientific investigations.

b. Write clear, coherent accounts of current scientific issues, including possible alternative interpretations of the data.

c. Use data as evidence to support scientific arguments and claims in written or oral presentations.

d. Participate in group discussions of scientific investigation and current scientific issues.

**SCSh7. Students will analyze how scientific knowledge is developed.**

Students will recognize that:

a. The universe is a vast single system in which the basic principles are the same everywhere.

b. Universal principles are discovered through observation and experimental verification.

c. From time to time, major shifts occur in the scientific view of how the world works. More often, however, the changes that take place in the body of scientific knowledge are small modifications of prior knowledge. Major shifts in scientific views typically occur after the observation of a new phenomenon or an insightful interpretation of existing data by an individual or research group.

d. Hypotheses often cause scientists to develop new experiments that produce additional data.

e. Testing, revising, and occasionally rejecting new and old theories never ends.

**SCSh8. Students will understand important features of the process of scientific inquiry.**

Students will apply the following to inquiry learning practices:

a. Scientific investigators control the conditions of their experiments in order to produce valuable data.

b. Scientific researchers are expected to critically assess the quality of data including possible sources of bias in their investigations’ hypotheses, observations, data analyses, and interpretations.

c. Scientists use practices such as peer review and publication to reinforce the integrity of scientific activity and reporting.

d. The merit of a new theory is judged by how well scientific data are explained by the new theory.

e. The ultimate goal of science is to develop an understanding of the natural universe which is free of biases.

f. Science disciplines and traditions differ from one another in what is studied, techniques used, and outcomes sought.

**SCSh9. Students will enhance reading in all curriculum areas by:**

a. Reading in All Curriculum Areas

Read a minimum of 25 grade-level appropriate books per year from a variety of subject disciplines and participate in discussions related to curricular learning in all areas.

Read both informational and fictional texts in a variety of genres and modes of discourse.

Read technical texts related to various subject areas.

b. Discussing books

Discuss messages and themes from books in all subject areas.

Respond to a variety of texts in multiple modes of discourse.

Relate messages and themes from one subject area to messages and themes in another area.

Evaluate the merit of texts in every subject discipline.

Examine author’s purpose in writing.

Recognize the features of disciplinary texts.

c. Building vocabulary knowledge

Demonstrate an understanding of contextual vocabulary in various subjects.

Use content vocabulary in writing and speaking.

Explore understanding of new words found in subject area texts.

d. Establishing context

Explore life experiences related to subject area content.

Discuss in both writing and speaking how certain words are subject area related.

Determine strategies for finding content and contextual meaning for unknown words.

**SPS1. Students will investigate our current understanding of the atom.**

a. Examine the structure of the atom in terms of proton, electron, and neutron locations. atomic mass and atomic number. atoms with different numbers of neutrons (isotopes).

explain the relationship of the proton number to the element’s identity.

b. Compare and contrast ionic and covalent bonds in terms of electron movement.

**SPS2. Students will explore the nature of matter, its classifications, and its system for naming types of matter.**

a. Calculate density when given a means to determine a substance’s mass and volume.

b. Predict formulas for stable binary ionic compounds based on balance of charges.

c. Use IUPAC nomenclature for transition between chemical names and chemical formulas of binary ionic compounds (containing representative elements).

binary covalent compounds (i.e. carbon dioxide, carbon tetrachloride).

d. Demonstrate the Law of Conservation of Matter in a chemical reaction.

e. Apply the Law of Conservation of Matter by balancing the following types of chemical equations: Synthesis Decomposition Single Replacement Double Replacement

**SPS3. Students will distinguish the characteristics and components of radioactivity.**

a. Differentiate among alpha and beta particles and gamma radiation.

b. Differentiate between fission and fusion.

c. Explain the process half-life as related to radioactive decay.

d. Describe nuclear energy, its practical application as an alternative energy source, and its potential problems.

**SPS4. Students will investigate the arrangement of the Periodic Table.**

a. Determine the trends of the following:

Number of valence electrons

Types of ions formed by representative elements Location of metals, nonmetals, and metalloids Phases at room temperature

b. Use the Periodic Table to predict the above properties for representative elements.

**SPS5. Students will compare and contrast the phases of matter as they relate to atomic and molecular motion.**

a. Compare and contrast the atomic/molecular motion of solids, liquids, gases and plasmas.

b. Relate temperature, pressure, and volume of gases to the behavior of gases.

**SPS6. Students will investigate the properties of solutions.**

a. Describe solutions in terms of solute/solvent conductivity concentration

b. Observe factors affecting the rate a solute dissolves in a specific solvent.

c. Demonstrate that solubility is related to temperature by constructing a solubility curve.

d. Compare and contrast the components and properties of acids and bases.

e. Determine whether common household substances are acidic, basic, or neutral.

**SPS7. Students will relate transformations and flow of energy within a system.**

a. Identify energy transformations within a system (e.g. lighting of a match).

b. Investigate molecular motion as it relates to thermal energy changes in terms of conduction, convection, and radiation.

c. Determine the heat capacity of a substance using mass, specific heat, and temperature.

d. Explain the flow of energy in phase changes through the use of a phase diagram.

**SPS8. Students will determine relationships among force, mass, and motion.**

a. Calculate velocity and acceleration.

b. Apply Newton’s three laws to everyday situations by explaining the following:

Inertia Relationship between force, mass and acceleration Equal and opposite forces

c. Relate falling objects to gravitational force

d. Explain the difference in mass and weight.

e. Calculate amounts of work and mechanical advantage using simple machines.

**SPS9. Students will investigate the properties of waves.**

a. Recognize that all waves transfer energy.

b. Relate frequency and wavelength to the energy of different types of electromagnetic waves and mechanical waves.

c. Compare and contrast the characteristics of electromagnetic and mechanical (sound) waves.

d. Investigate the phenomena of reflection, refraction, interference, and diffraction.

e. Relate the speed of sound to different mediums.

f. Explain the Doppler Effect in terms of everyday interactions.

**SPS10. Students will investigate the properties of electricity and magnetism.**

a. Investigate static electricity in terms of friction induction conduction

b. Explain the flow of electrons in terms of alternating and direct current.

the relationship among voltage, resistance and current. simple series and parallel circuits.

c. Investigate applications of magnetism and/or its relationship to the movement of electrical charge as it relates to electromagnets simple motors permanent magnets

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| DJJ High School Physical Science  Georgia Performance Standards:  Curriculum Map | | | | | | | | | | | |
| **1st Semester** | | | | | | **2nd Semester** | | | | | |
| **Energy and Motion** | | **Electricity and Energy** | | **Energy on the Move** | | **The Nature of Matter** | | **Diversity of Matter** | | **Interactions of Matter** | |
| **Chapter**  1 | **CAPs**  1-4 | **Chapter**  7 | **CAPs**  20-23 | **Chapter**  10 | **CAPs**  31-33 | **Chapter**  15 | **CAPs**  47-48 | **Chapter**  19 | **CAPs**  61-63 | **Chapter**  22 | **CAPs**  71-74 |
| 2 | 5-7 | 8 | 24-26 | 11 | 34-36 | 16 | 49-52 | 20 | 64-66 | 23 | 75-77 |
| 3 | 8-10 | 9 | 27-30 | 12 | 37-39 | 17 | 53-56 | 21 | 67-70 | 24 | 78-81 |
| 4 | 11-12 |  |  | 13 | 40-42 | 18 | 57-60 |  |  | 25 | 82-85 |
| 5 | 13-15 |  |  | 14 | 43-46 |  |  |  |  |  |  |
| 6 | 16-19 |  |  |  |  |  |  |  |  |  |  |
| **GPS:**  SCSh3c,e,d,f  SCSh4a  SCSh1a,c,b  SCSh9c  SPS8a,b,d  SPS7a,b,c | | **GPS:**  SCSh1a,b,c  SCSh3c,e,f  SCSh4a  SCSh9c  SPS10a,c  SPS7a | | **GPS:**  SCSh9c  SCSh1a,b,c  SCSh3c,e,f  SCSh4a  SPS9b,c  SCSh5d  SCSh7c | | **GPS:**  SCSh1a,b,c  SCSh3c,e,f  SCSh4a  SCSh9c  SPS5a  SPS4a,b  SCSh7c | | **GPS:**  SCSh1a,b,c  SCSh3c,e,f  SCSh4a  SCSh9c  SPS2a,b,c,d,e  SPS4a | | **GPS:**  SCSh1a,b  SCSh3c,e,f  SCSh4a  SCSh9c  SPS6a,b,c,d,e | |
| **Focus CAPs:**  4,7,10,12,15,19 | | **Focus CAPs:**  23,26,30 | | **Focus CAPs:**  33,36,39,42,46 | | Focus CAPs:  48,52,56,60 | | **Focus CAPs:**  63,66,70 | | **Focus CAPs:**  74,77,81,85 | |

**Enduring Understandings & Essential Questions**

**Energy and Motion**

**Motion:**

**Enduring Understandings:**

Objects change their motion only when a net force is applied.

Force, mass, and acceleration are interdependent.

A change in any one of these affects the others.

Knowledge of the conditions of an object’s motion allows us to predict their future.

Friction is an ever present force that opposes motion.

For gaseous substances, pressure, volume, and temperature are interdependent.

Whenever one object exerts a force on another other, an equal amount of force is exerted back on it.

A system is an ensemble of objects (real or abstract) in which each component relates to at least one other component of the group.

Temperature is a measure of the internal energy of the system.

The greater the particle or molecular motion the higher the internal energy of a system.

The phases of matter are states of a system that have relatively the same physical properties.

A change in the energy of a system affects the attraction between the particles or molecules and a phase change may occur.

Density is a physical property that can be quantitatively measured using mass and volume.

**Essential Questions:**

How is force related to motion?

How do unbalanced forces affect motion?

Why do objects in motion stay in motion?

How does a skateboarder use Newton’s three Laws of Motion?

How would Newton explain the often heard phrase, “The Force be with you”?

Will a specific force produce the same motion on different objects?

Why does it take longer to cook grits in Denver than in Savannah?

What floats your boat? How are mass and volume related to density?

How do the arrangement and energy of particles determine the phases of matter?

How do changes in pressure, volume, or temperature of a gas relate to each other?

What is the relationship between distance, speed, and time?

**Energy:**

**Enduring Understandings:**

Transformations of energy usually release some energy typically in the form of heat.

Heat transfer occurs by conduction, convection, or radiation into cooler places.

Different substances absorb different amounts of heat before their temperature changes.

Temperature can change as heat is being transferred.

If a substance’s temperature or pressure is altered, a phase change may result.

Waves carry energy that can be transferred or transformed in interactions with matter or other waves.

The pitch of a sound is a measure of its frequency.

Although electromagnetic and mechanical waves share some characteristics, they are different in the way they are generated and transfer energy.

The speed at which sound travels is dependent upon the material in which it travels.

As a wave encounters another medium it may be reflected and/or refracted.

As a wave encounters an obstacle or an opening it may be reflected, refracted, and/or diffracted.

**Essential Questions:**

How is energy transferred from one place to another?

If I still have to do the same amount of work, why would I want to use a simple machine?

What actually happens during a phase change?

Why is the temperature of an ice water mixture constant?

How do light and sound transfer energy from one place to another?

What happens to light as it moves through different media?

What happens to sound as it moves through different media?

What happens when two waves meet while they travel through the same medium?

Why do all current nuclear power plants use fission reactors?

How does the production of electricity in nuclear power plants in Georgia affect our state?

**Electricity and Energy Resources**

**Enduring Understandings:**

Electric current is the result of the motion of charged particles across a conductor. Friction forces can cause the accumulation of an unbalanced amount of charged particles on the surface of an object.

The voltage created between two objects due to the presence of an unbalanced charged may create an electric spark or shock.

Electrons can be transferred from one charged conductor to another by physical contact. When a charged object is moved into proximity to a conductor, the conductor is charged by induction.

An electric current requires a complete circuit and a voltage source.

The amount of current that flows in a circuit depends on both the resistance and the voltage of the source. In a series circuit the same amount of current flows through all the components.

In a parallel circuit the voltage drop across each component is equal and equal to the voltage of the power source.

In a direct current circuit the electrons flow in only one direction.

In an alternating current the motion of the electrons alternates back and forth due to the changing polarity of the voltage source.

Charges in motion generate magnetic fields.

Variable magnetic fields induce currents in a circuit.

A moving electric charge, or current, in a magnetic field experiences a force.

**Essential Questions:**

What does it mean when something is electrically charged?

How can object become electrically charged?

Why can small birds sit on high-voltage power lines?

Why does striking a magnet with something hard weaken its magnetism?

Why is an alternating current necessary for a motor to work?

Why is an electromagnet more powerful when it possesses an iron core?

What characteristics of the material make it a good conductor or insulator?

Why are insulators attracted to charged objects?

Why is alternating current commonly used in household applications?

How do electric generators work?

How are electric generators and motors different and alike?

How do transformers work?

How is an electromagnet made?

**Energy on the Move**

**Enduring Understandings:**

An electric current requires a complete circuit and a voltage source.

The amount of current that flows in a circuit depends on both the resistance and the voltage of the source. In a series circuit the same amount of current flows through all the components.

In a parallel circuit the voltage drop across each component is equal and equal to the voltage of the power source.

In a direct current circuit the electrons flow in only one direction.

In an alternating current the motion of the electrons alternates back and forth due to the changing polarity of the voltage source.

Charges in motion generate magnetic fields.

Variable magnetic fields induce currents in a circuit

**Essential Questions:**

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How do light and sound transfer energy from one place to another?

What happens to light as it moves through different media?

What happens to sound as it moves through different media?

What happens when two waves meet while they travel through the same medium?

Why do all current nuclear power plants use fission reactors?

How does the production of electricity in nuclear power plants in Georgia affect our state?

**The Nature of Matter**

**Diversity of Matter & Interactions of Matter**

**Enduring Understandings:**

The characteristics of an atom are determined by its structure.

A change in the nuclear structure and/or electron configuration results in the emission of radiation.

Valance electrons determine the chemical properties of atoms.

Nuclear reactions convert matter into energy through the process of radioactive decay, fission and fusion.

The rate of radioactive decay for an isotope is constant and is measured by half-life.

Number of protons determines the type of element.

The more stable physical/chemical system is the system that is at its lowest energy state.

The elements, arranged by increasing atomic number, exhibit periodic trends in properties.

Non stable nuclei are radioactive and emit ionizing radiation in the form of alpha, beta, or gamma radiation.

Properties such as valence, ion formation, metallic or nonmetallic properties, and phase at room temperature, can be predicted for representative elements by using the periodic table.

Chemical reactions are the result of changes in electron configuration.

Classical Physics (Mechanics, Electricity and Magnetism) lead to the discovery of subatomic particles and the nucleus.

**Essential Questions:**

How do the subatomic particles of an atom affect its characteristics?

How would the mass of a 10-g sample of carbon-14 change after one half life?

In what ways does nuclear radiation affect living things?

If there were an ionizing radiation leak in this room, how would you shield yourself?

How can nuclear radiation be both dangerous and beneficial to humans?

How does knowing trends on the Periodic Table help scientists predict properties of the representative elements?

Why do some atoms gain electrons while others lose them in chemical reactions?

If an atom loses an electron, why would the resulting particle have a positive charge?

How do we know if a chemical reaction has occurred?

How does atomic structure relate to bonding patterns?

How is the valence of the atom determined?

Why do chemists need a system for naming and writing compounds?

Why do we need to balance chemical equations?

What happens if an equal number of hydrogen ions and hydroxide ions are in a solution?

How does our understanding of the properties of acids and bases help us in our everyday lives?

How does our understanding of the properties of solutions help us in our everyday lives?

How are solutions different from compounds?

**Energy and Motion**

**Georgia Performance Standards:**

**SCSh3. Students will identify and investigate problems scientifically.**

c. Collect, organize and record appropriate data.

d. Graphically compare and analyze data points and/or summary statistics.

e. Develop reasonable conclusions based on data collected.

f. Evaluate whether conclusions are reasonable by reviewing the process and checking against other available information.

**SCSh4. Students will use tools and instruments for observing, measuring, and manipulating scientific equipment and materials.**

a. Develop and use systematic procedures for recording and organizing information.

**SCSh1. Students will evaluate the importance of curiosity, honesty, openness, and skepticism in science.**

a. Exhibit the above traits in their own scientific activities.

b. Recognize that different explanations often can be given for the same evidence.

c. Explain that further understanding of scientific problems relies on the design and execution of new experiments which may reinforce or weaken opposing explanations.

**SCSh9. Students will enhance reading in all curriculum areas by:**

c. Building vocabulary knowledge

Demonstrate an understanding of contextual vocabulary in various subjects.

Use content vocabulary in writing and speaking.

Explore understanding of new words found in subject area texts.

**SPS8. Students will determine relationships among force, mass, and motion.**

a. Calculate velocity and acceleration.

b. Apply Newton’s three laws to everyday situations by explaining the following:

Inertia Relationship between force, mass and acceleration Equal and opposite forces

d. Explain the difference in mass and weight.

**SPS7. Students will relate transformations and flow of energy within a system.**

a. Identify energy transformations within a system (e.g. lighting of a match).

b. Investigate molecular motion as it relates to thermal energy changes in terms of conduction, convection, and radiation.

c. Determine the heat capacity of a substance using mass, specific heat, and temperature.

**Task: 1**

**Essential Question:**

How is force related to motion?

How do unbalanced forces affect motion?

Why do objects in motion stay in motion?

How does a skateboarder use Newton’s three Laws of Motion?

Will a specific force produce the same motion on different objects?

What is the relationship between distance, speed, and time?

**Resources:**

[What is the relationship between distance, speed, and time virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/E12/E12.html)

[Motion of Earths Continents](http://glencoe.mcgraw-hill.com/olcweb/cgi/pluginpop.cgi?it=swf::490::356::/sites/dl/free/0078779626/164037/626_Fig_8.swf::Motion%20of%20Earths%20Continents)

[Describing Motion Quick Check](http://glencoe.mcgraw-hill.com/sites/0078779626/student_view0/unit1/chapter2/section_1_self-check_quiz-eng_.html)

**Teacher’s Place:**

Prior to beginning the performance activity, the teacher should implement the following steps using teaching techniques you have found to be effective for your students.

1. Explain the activity (activity requirements)

2. Display the Georgia Performance Standard(s) (project on blackboard via units of instruction located at <http://thevillage411.weebly.com/units-of-instruction2.html> units of instruction page, or print on blackboard)

3. Read the Georgia Performance Standard(s) aloud and explain it to your students. You can rephrase the Georgia Performance Standard to make sure your students understand it.

4. Display the Essential Question(s) (project on blackboard via units of instruction, or print on blackboard)

5. Read the Essential Question (s) aloud and explain it to your students. You can rephrase the Essential Question (s) to make sure your students understand it.

6. Review unit vocabulary with students.

7. Introduce the following:

a. Motion: Describing Motion p.38

8. Engage students in conversation by asking students the following question: What is the speed limit in front of your home? Write answers on the blackboard.

9. Discuss answers with the students using the following questioning techniques as applicable:

**Questioning Techniques:**

**Memory Questions**

Signal words: who, what, when, where?

Cognitive operations: naming, defining, identifying, designating

**Convergent Thinking Questions**

Signal words: who, what, when, where?

Cognitive operations: explaining, stating relationships, comparing and

contrasting

**Divergent Thinking Questions**

Signal words: imagine, suppose, predict, if/then

Cognitive operations: predicting, hypothesizing, inferring, reconstructing

**Evaluative Thinking Questions**

Signal words: defend, judge, justify (what do you think)?

10. Guide students into the activity utilizing [What is the relationship between distance, speed, and time virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/E12/E12.html)

11. Complete the activity with the students (some tasks may require students to work independently, peer to peer, learning circles [2-3 students] or as a whole group [the entire class]. Therefore the teacher may serve as activity leader and or facilitator. When an activity calls for students to work in learning circles you should assign roles to students individually i.e. recorder, discussion leader or presenter)

12. At the end of the **\*whole group learning session**, students will transition into independent CAP assignments.

**\*The phrase, “whole group learning session” is utilized “rather than, the end of the activity” because all of the activities may not be completed in one day.**

**Activity**

The teacher and students will complete [What is the relationship between distance, speed, and time virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/E12/E12.html) as a whole group activity. Students will work in cooperative learning groups to complete the journal activity.

The teacher and students will review today’s lesson by completing the [Describing Motion Quick Check](http://glencoe.mcgraw-hill.com/sites/0078779626/student_view0/unit1/chapter2/section_1_self-check_quiz-eng_.html).

**Task: 2**

**Essential Question:**

Why do objects in motion stay in motion?

How does a skateboarder use Newton’s three Laws of Motion?

How would Newton explain the often heard phrase, “The Force be with you”?

Will a specific force produce the same motion on different objects?

**Resources:**

[How does horizontal motion affect vertical motion virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/PS04/PS04.html)

[Acceleration Quick Check](ttp://glencoe.mcgraw-hill.com/sites/0078778360/student_view0/chapter1/section1/self-check_quiz-eng_.html)

**Teacher’s Place:**

Prior to beginning the performance activity, the teacher should implement the following steps using teaching techniques you have found to be effective for your students.

1. Explain the activity (activity requirements)

2. Display the Georgia Performance Standard(s) (project on blackboard via units of instruction located at <http://thevillage411.weebly.com/units-of-instruction2.html> units of instruction page, or print on blackboard)

3. Read the Georgia Performance Standard(s) aloud and explain it to your students. You can rephrase the Georgia Performance Standard to make sure your students understand it.

4. Display the Essential Question(s) (project on blackboard via units of instruction, or print on blackboard)

5. Read the Essential Question (s) aloud and explain it to your students. You can rephrase the Essential Question (s) to make sure your students understand it.

6. Review unit vocabulary with students.

7. Introduce the following:

a. Motion: Acceleration p.47

8. Engage students in conversation by asking students the following question: What does the phrase step on the gas mean? Write answers on the blackboard.

9. Discuss answers with the students using the following questioning techniques as applicable:

**Questioning Techniques:**

**Memory Questions**

Signal words: who, what, when, where?

Cognitive operations: naming, defining, identifying, designating

**Convergent Thinking Questions**

Signal words: who, what, when, where?

Cognitive operations: explaining, stating relationships, comparing and

contrasting

**Divergent Thinking Questions**

Signal words: imagine, suppose, predict, if/then

Cognitive operations: predicting, hypothesizing, inferring, reconstructing

**Evaluative Thinking Questions**

Signal words: defend, judge, justify (what do you think)?

10. Guide students into the activity utilizing [How does horizontal motion affect vertical motion virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/PS04/PS04.html)

11. Complete the activity with the students (some tasks may require students to work independently, peer to peer, learning circles [2-3 students] or as a whole group [the entire class]. Therefore the teacher may serve as activity leader and or facilitator. When an activity calls for students to work in learning circles you should assign roles to students individually i.e. recorder, discussion leader or presenter)

12. At the end of the **\*whole group learning session**, students will transition into independent CAP assignments.

**\*The phrase, “whole group learning session” is utilized “rather than, the end of the activity” because all of the activities may not be completed in one day.**

**Activity**

The teacher and students will complete [How does horizontal motion affect vertical motion virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/PS04/PS04.html) as a whole group activity. Students will complete the journal activity as a ticket out the door.

The teacher and students will review today’s lesson by completing the [Acceleration Quick Check](ttp://glencoe.mcgraw-hill.com/sites/0078778360/student_view0/chapter1/section1/self-check_quiz-eng_.html).

**Task: 3**

**Essential Question:**

Why do objects in motion stay in motion?

How does a skateboarder use Newton’s three Laws of Motion?

How would Newton explain the often heard phrase, “The Force be with you”?

Will a specific force produce the same motion on different objects?

Why does it take longer to cook grits in Denver than in Savannah?

**Resources:**

[How is momentum conserved in a vehicle collision virtual lab](http://www.glencoe.com/sites/common_assets/science/virtual_labs/E24/E24.html)

[Newton's Laws of Motion Virtual Lesson](http://glencoe.mcgraw-hill.com/sites/dl/free/0078779626/161752/00035803.html)

[Standardized Test Practice](http://glencoe.mcgraw-hill.com/sites/0078778360/student_view0/chapter2/standardized_test_practice.html)

**Teacher’s Place:**

Prior to beginning the performance activity, the teacher should implement the following steps using teaching techniques you have found to be effective for your students.

1. Explain the activity (activity requirements)

2. Display the Georgia Performance Standard(s) (project on blackboard via units of instruction located at <http://thevillage411.weebly.com/units-of-instruction2.html> units of instruction page, or print on blackboard)

3. Read the Georgia Performance Standard(s) aloud and explain it to your students. You can rephrase the Georgia Performance Standard to make sure your students understand it.

4. Display the Essential Question(s) (project on blackboard via units of instruction, or print on blackboard)

5. Read the Essential Question (s) aloud and explain it to your students. You can rephrase the Essential Question (s) to make sure your students understand it.

6. Review unit vocabulary with students.

7. Introduce the following:

a. Forces: Newton’s Third Law of Motion p.83

8. Engage students in conversation by asking students the following question: What can a football player do to increase his/her momentum? Write answers on the blackboard.

9. Discuss answers with the students using the following questioning techniques as applicable:

**Questioning Techniques:**

**Memory Questions**

Signal words: who, what, when, where?

Cognitive operations: naming, defining, identifying, designating

**Convergent Thinking Questions**

Signal words: who, what, when, where?

Cognitive operations: explaining, stating relationships, comparing and

contrasting

**Divergent Thinking Questions**

Signal words: imagine, suppose, predict, if/then

Cognitive operations: predicting, hypothesizing, inferring, reconstructing

**Evaluative Thinking Questions**

Signal words: defend, judge, justify (what do you think)?

10. Guide students into the activity utilizing [How is momentum conserved in a vehicle collision virtual lab](http://www.glencoe.com/sites/common_assets/science/virtual_labs/E24/E24.html)

11. Complete the activity with the students (some tasks may require students to work independently, peer to peer, learning circles [2-3 students] or as a whole group [the entire class]. Therefore the teacher may serve as activity leader and or facilitator. When an activity calls for students to work in learning circles you should assign roles to students individually i.e. recorder, discussion leader or presenter)

12. At the end of the **\*whole group learning session**, students will transition into independent CAP assignments.

**\*The phrase, “whole group learning session” is utilized “rather than, the end of the activity” because all of the activities may not be completed in one day.**

**Activity**

The teacher and students will complete [How is momentum conserved in a vehicle collision virtual lab](http://www.glencoe.com/sites/common_assets/science/virtual_labs/E24/E24.html) as a whole group activity. Students will work in cooperative learning groups to complete the journal activity.

The teacher and students will review today’s lesson by completing the [Standardized Test Practice](http://glencoe.mcgraw-hill.com/sites/0078778360/student_view0/chapter2/standardized_test_practice.html).

**Task: 4**

**Essential Question:**

How is energy transferred from one place to another?

If I still have to do the same amount of work, why would I want to use a simple machine?

What actually happens during a phase change?

Why is the temperature of an ice water mixture constant?

How do light and sound transfer energy from one place to another?

What happens to light as it moves through different media?

What happens to sound as it moves through different media?

What happens when two waves meet while they travel through the same medium?

Why do all current nuclear power plants use fission reactors?

How does the production of electricity in nuclear power plants in Georgia affect our state?

**Resources:**

[How is energy converted from one form to another virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/E04/E04.html)

[Standardized Test Practice](http://glencoe.mcgraw-hill.com/sites/0078779626/student_view0/unit1/chapter4/standardized_test_practice.html)

[Energy Transformation virtual concept](http://glencoe.mcgraw-hill.com/olcweb/cgi/pluginpop.cgi?it=swf::573::321::/sites/dl/free/0078779626/164037/628_Fig_8.swf::Energy%20Transformation)

[Math across the science curriculum review item](http://glencoe.mcgraw-hill.com/sites/0078778360/student_view0/chapter2/math_practice.html)

**Teacher’s Place:**

Prior to beginning the performance activity, the teacher should implement the following steps using teaching techniques you have found to be effective for your students.

1. Explain the activity (activity requirements)

2. Display the Georgia Performance Standard(s) (project on blackboard via units of instruction located at <http://thevillage411.weebly.com/units-of-instruction2.html> units of instruction page, or print on blackboard)

3. Read the Georgia Performance Standard(s) aloud and explain it to your students. You can rephrase the Georgia Performance Standard to make sure your students understand it.

4. Display the Essential Question(s) (project on blackboard via units of instruction, or print on blackboard)

5. Read the Essential Question (s) aloud and explain it to your students. You can rephrase the Essential Question (s) to make sure your students understand it.

6. Review unit vocabulary with students.

7. Introduce the following:

a. Energy: The Nature of Energy p.100

8. Engage students in conversation by asking students the following question: How is the word energy commonly used? Write answers on the blackboard.

9. Discuss answers with the students using the following questioning techniques as applicable:

**Questioning Techniques:**

**Memory Questions**

Signal words: who, what, when, where?

Cognitive operations: naming, defining, identifying, designating

**Convergent Thinking Questions**

Signal words: who, what, when, where?

Cognitive operations: explaining, stating relationships, comparing and

contrasting

**Divergent Thinking Questions**

Signal words: imagine, suppose, predict, if/then

Cognitive operations: predicting, hypothesizing, inferring, reconstructing

**Evaluative Thinking Questions**

Signal words: defend, judge, justify (what do you think)?

10. Guide students into the activity utilizing [How is energy converted from one form to another virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/E04/E04.html)

11. Complete the activity with the students (some tasks may require students to work independently, peer to peer, learning circles [2-3 students] or as a whole group [the entire class]. Therefore the teacher may serve as activity leader and or facilitator. When an activity calls for students to work in learning circles you should assign roles to students individually i.e. recorder, discussion leader or presenter)

12. At the end of the **\*whole group learning session**, students will transition into independent CAP assignments.

**\*The phrase, “whole group learning session” is utilized “rather than, the end of the activity” because all of the activities may not be completed in one day.**

**Activity**

The teacher and students will complete [How is energy converted from one form to another virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/E04/E04.html) as a whole group activity. Students will complete the journal activity as a ticket out the door.

The teacher and students will review today’s lesson by completing the [Standardized Test Practice](http://glencoe.mcgraw-hill.com/sites/0078779626/student_view0/unit1/chapter4/standardized_test_practice.html).

The teacher and student will complete the [Math across the science curriculum review item](http://glencoe.mcgraw-hill.com/sites/0078778360/student_view0/chapter2/math_practice.html) as a lesson wrap up.

**Electricity and Energy**

**Georgia Performance Standards:**

**SCSh1. Students will evaluate the importance of curiosity, honesty, openness, and skepticism in science.**

a. Exhibit the above traits in their own scientific activities.

b. Recognize that different explanations often can be given for the same evidence.

c. Explain that further understanding of scientific problems relies on the design and execution of new experiments which may reinforce or weaken opposing explanations.

**SCSh3. Students will identify and investigate problems scientifically.**

c. Collect, organize and record appropriate data.

d. Graphically compare and analyze data points and/or summary statistics.

e. Develop reasonable conclusions based on data collected.

f. Evaluate whether conclusions are reasonable by reviewing the process and checking against other available information.

**SCSh4. Students will use tools and instruments for observing, measuring, and manipulating scientific equipment and materials.**

a. Develop and use systematic procedures for recording and organizing information.

**SCSh9. Students will enhance reading in all curriculum areas by:**

c. Building vocabulary knowledge

Demonstrate an understanding of contextual vocabulary in various subjects.

Use content vocabulary in writing and speaking.

Explore understanding of new words found in subject area texts.

**SPS10. Students will investigate the properties of electricity and magnetism.**

a. Investigate static electricity in terms of friction induction conduction

c. Investigate applications of magnetism and/or its relationship to the movement of electrical charge as it relates to electromagnets simple motors permanent magnets

**SPS7. Students will relate transformations and flow of energy within a system.**

a. Identify energy transformations within a system (e.g. lighting of a match).

**Task: 1**

**Essential Question:**

What does it mean when something is electrically charged?

How can object become electrically charged?

Why can small birds sit on high-voltage power lines?

Why does striking a magnet with something hard weaken its magnetism?

**Resources:**

[How are voltage, current, and resistance related virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/E14/E14.html)

[Standardized Test Practice](http://glencoe.mcgraw-hill.com/sites/0078779626/student_view0/unit2/chapter7/standardized_test_practice.html)

[Static Charge Concept](http://glencoe.mcgraw-hill.com/olcweb/cgi/pluginpop.cgi?it=swf::573::205::/sites/dl/free/0078778387/164155/644_Fig_8.swf::Static%20Charge)

[Simple Electric Circuit Concept](http://glencoe.mcgraw-hill.com/olcweb/cgi/pluginpop.cgi?it=swf::402::356::/sites/dl/free/0078778387/164155/644_Fig_11.swf::Simple%20Electric%20Circuit)

**Teacher’s Place:**

Prior to beginning the performance activity, the teacher should implement the following steps using teaching techniques you have found to be effective for your students.

1. Explain the activity (activity requirements)

2. Display the Georgia Performance Standard(s) (project on blackboard via units of instruction located at <http://thevillage411.weebly.com/units-of-instruction2.html> units of instruction page, or print on blackboard)

3. Read the Georgia Performance Standard(s) aloud and explain it to your students. You can rephrase the Georgia Performance Standard to make sure your students understand it.

4. Display the Essential Question(s) (project on blackboard via units of instruction, or print on blackboard)

5. Read the Essential Question (s) aloud and explain it to your students. You can rephrase the Essential Question (s) to make sure your students understand it.

6. Review unit vocabulary with students.

7. Introduce the following:

a. Electricity: Electric Current p.200

8. Engage students in conversation by asking students the following question: How do people use the energy in water currents? Write answers on the blackboard.

9. Discuss answers with the students using the following questioning techniques as applicable:

**Questioning Techniques:**

**Memory Questions**

Signal words: who, what, when, where?

Cognitive operations: naming, defining, identifying, designating

**Convergent Thinking Questions**

Signal words: who, what, when, where?

Cognitive operations: explaining, stating relationships, comparing and

contrasting

**Divergent Thinking Questions**

Signal words: imagine, suppose, predict, if/then

Cognitive operations: predicting, hypothesizing, inferring, reconstructing

**Evaluative Thinking Questions**

Signal words: defend, judge, justify (what do you think)?

10. Guide students into the activity utilizing [How are voltage, current, and resistance related virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/E14/E14.html)

11. Complete the activity with the students (some tasks may require students to work independently, peer to peer, learning circles [2-3 students] or as a whole group [the entire class]. Therefore the teacher may serve as activity leader and or facilitator. When an activity calls for students to work in learning circles you should assign roles to students individually i.e. recorder, discussion leader or presenter)

12. At the end of the **\*whole group learning session**, students will transition into independent CAP assignments.

**\*The phrase, “whole group learning session” is utilized “rather than, the end of the activity” because all of the activities may not be completed in one day.**

**Activity**

The teacher and students will complete [How are voltage, current, and resistance related virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/E14/E14.html) as a whole group activity. The teacher and students will complete the journal activity as a whole group activity.

The teacher and students will review today’s lesson by completing the [Standardized Test Practice](http://glencoe.mcgraw-hill.com/sites/0078779626/student_view0/unit2/chapter7/standardized_test_practice.html).

The teacher and student will complete the [Math across the curriculum test item](http://glencoe.mcgraw-hill.com/sites/0078778387/student_view0/chapter1/math_practice_1.html).

**Task: 2**

**Essential Question:**

What does it mean when something is electrically charged?

How can object become electrically charged?

Why is alternating current commonly used in household applications?

How do electric generators work?

How are electric generators and motors different and alike?

**Resources:**

[How does a generator work virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/PS22/PS22.html)

[Standardized Test Practice](http://glencoe.mcgraw-hill.com/sites/0078779626/student_view0/unit2/chapter8/standardized_test_practice.html)

[Electric Current concept video lesson](http://glencoe.mcgraw-hill.com/sites/dl/free/0078779626/160350/00076706.html)

**Teacher’s Place:**

Prior to beginning the performance activity, the teacher should implement the following steps using teaching techniques you have found to be effective for your students.

1. Explain the activity (activity requirements)

2. Display the Georgia Performance Standard(s) (project on blackboard via units of instruction located at <http://thevillage411.weebly.com/units-of-instruction2.html> units of instruction page, or print on blackboard)

3. Read the Georgia Performance Standard(s) aloud and explain it to your students. You can rephrase the Georgia Performance Standard to make sure your students understand it.

4. Display the Essential Question(s) (project on blackboard via units of instruction, or print on blackboard)

5. Read the Essential Question (s) aloud and explain it to your students. You can rephrase the Essential Question (s) to make sure your students understand it.

6. Review unit vocabulary with students.

7. Introduce the following:

a. Magnetism and its Uses: Producing Electric Current p.238

8. Engage students in conversation by asking students the following question: What sources of energy can be converted to electric current? Write answers on the blackboard.

9. Discuss answers with the students using the following questioning techniques as applicable:

**Questioning Techniques:**

**Memory Questions**

Signal words: who, what, when, where?

Cognitive operations: naming, defining, identifying, designating

**Convergent Thinking Questions**

Signal words: who, what, when, where?

Cognitive operations: explaining, stating relationships, comparing and

contrasting

**Divergent Thinking Questions**

Signal words: imagine, suppose, predict, if/then

Cognitive operations: predicting, hypothesizing, inferring, reconstructing

**Evaluative Thinking Questions**

Signal words: defend, judge, justify (what do you think)?

10. Guide students into the activity utilizing [How does a generator work virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/PS22/PS22.html)

11. Complete the activity with the students (some tasks may require students to work independently, peer to peer, learning circles [2-3 students] or as a whole group [the entire class]. Therefore the teacher may serve as activity leader and or facilitator. When an activity calls for students to work in learning circles you should assign roles to students individually i.e. recorder, discussion leader or presenter)

12. At the end of the **\*whole group learning session**, students will transition into independent CAP assignments.

**\*The phrase, “whole group learning session” is utilized “rather than, the end of the activity” because all of the activities may not be completed in one day.**

**Activity**

The teacher and students will complete [How does a generator work virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/PS22/PS22.html)

as a whole group activity. Students will work in learning circles to complete the journal activity.

The teacher and students will review today’s lesson by completing the [Standardized Test Practice](http://glencoe.mcgraw-hill.com/sites/0078779626/student_view0/unit2/chapter8/standardized_test_practice.html).

**Task: 3**

**Essential Question:**

How do transformers work?

**Resources:**

[How does a transformer work virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/E15/E15.html)

[Standardized Test Practice](http://glencoe.mcgraw-hill.com/sites/0078778387/student_view0/chapter2/standardized_test_practice.html)

**Teacher’s Place:**

Prior to beginning the performance activity, the teacher should implement the following steps using teaching techniques you have found to be effective for your students.

1. Explain the activity (activity requirements)

2. Display the Georgia Performance Standard(s) (project on blackboard via units of instruction located at <http://thevillage411.weebly.com/units-of-instruction2.html> units of instruction page, or print on blackboard)

3. Read the Georgia Performance Standard(s) aloud and explain it to your students. You can rephrase the Georgia Performance Standard to make sure your students understand it.

4. Display the Essential Question(s) (project on blackboard via units of instruction, or print on blackboard)

5. Read the Essential Question (s) aloud and explain it to your students. You can rephrase the Essential Question (s) to make sure your students understand it.

6. Review unit vocabulary with students.

7. Review the following:

a. Magnetism and its Uses: Producing Electric Current p.238

8. Engage students in conversation by asking students the following question: Can transformers increase or decrease voltage? Write answers on the blackboard.

9. Discuss answers with the students using the following questioning techniques as applicable:

**Questioning Techniques:**

**Memory Questions**

Signal words: who, what, when, where?

Cognitive operations: naming, defining, identifying, designating

**Convergent Thinking Questions**

Signal words: who, what, when, where?

Cognitive operations: explaining, stating relationships, comparing and

contrasting

**Divergent Thinking Questions**

Signal words: imagine, suppose, predict, if/then

Cognitive operations: predicting, hypothesizing, inferring, reconstructing

**Evaluative Thinking Questions**

Signal words: defend, judge, justify (what do you think)?

10. Guide students into the activity utilizing [How does a transformer work virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/E15/E15.html)

11. Complete the activity with the students (some tasks may require students to work independently, peer to peer, learning circles [2-3 students] or as a whole group [the entire class]. Therefore the teacher may serve as activity leader and or facilitator. When an activity calls for students to work in learning circles you should assign roles to students individually i.e. recorder, discussion leader or presenter)

12. At the end of the **\*whole group learning session**, students will transition into independent CAP assignments.

**\*The phrase, “whole group learning session” is utilized “rather than, the end of the activity” because all of the activities may not be completed in one day.**

**Activity**

The teacher and students will complete [How does a transformer work virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/E15/E15.html) as a whole group activity. Students will work in cooperative learning groups to complete the journal activity.

The teacher and students will review today’s lesson by completing the [Standardized Test Practice](http://glencoe.mcgraw-hill.com/sites/0078778387/student_view0/chapter2/standardized_test_practice.html).

**Task: 4**

**Essential Question:**

How is energy transferred from one place to another?

How do light and sound transfer energy from one place to another?

What happens to light as it moves through different media?

What happens to sound as it moves through different media?

What happens when two waves meet while they travel through the same medium?

Why do all current nuclear power plants use fission reactors?

How does the production of electricity in nuclear power plants in Georgia affect our state?

**Resources:**

[How much electricity is used in a house virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/E10/E10.html)

[How Electric Gets to Your House virtual concept](http://glencoe.mcgraw-hill.com/olcweb/cgi/pluginpop.cgi?it=swf::573::356::/sites/dl/free/0078617731/164155/645_Fig_19.swf::How%20Electric%20Gets%20to%20Your%20House)

[Geothermal Power Plant Concept](http://glencoe.mcgraw-hill.com/olcweb/cgi/pluginpop.cgi?it=swf::283::356::/sites/dl/free/0078779626/164037/625_Fig_25.swf::Geothermal%20Power%20Plant)

[Standardized Test Practice](http://glencoe.mcgraw-hill.com/sites/0078779626/student_view0/unit2/chapter9/standardized_test_practice.html)

[Chapter 9 Quick Check](http://glencoe.mcgraw-hill.com/sites/0078779626/student_view0/unit2/chapter9/section_1_self-check_quiz-eng_.html)

**Teacher’s Place:**

Prior to beginning the performance activity, the teacher should implement the following steps using teaching techniques you have found to be effective for your students.

1. Explain the activity (activity requirements)

2. Display the Georgia Performance Standard(s) (project on blackboard via units of instruction located at <http://thevillage411.weebly.com/units-of-instruction2.html> units of instruction page, or print on blackboard)

3. Read the Georgia Performance Standard(s) aloud and explain it to your students. You can rephrase the Georgia Performance Standard to make sure your students understand it.

4. Display the Essential Question(s) (project on blackboard via units of instruction, or print on blackboard)

5. Read the Essential Question (s) aloud and explain it to your students. You can rephrase the Essential Question (s) to make sure your students understand it.

6. Review unit vocabulary with students.

7. Introduce the following:

a. Energy Sources: Fossil Fuels p.256

8. Engage students in conversation by asking students the following question: How do people use energy in their everyday lives? Write answers on the blackboard.

9. Discuss answers with the students using the following questioning techniques as applicable:

**Questioning Techniques:**

**Memory Questions**

Signal words: who, what, when, where?

Cognitive operations: naming, defining, identifying, designating

**Convergent Thinking Questions**

Signal words: who, what, when, where?

Cognitive operations: explaining, stating relationships, comparing and

contrasting

**Divergent Thinking Questions**

Signal words: imagine, suppose, predict, if/then

Cognitive operations: predicting, hypothesizing, inferring, reconstructing

**Evaluative Thinking Questions**

Signal words: defend, judge, justify (what do you think)?

10. Guide students into the activity utilizing [How much electricity is used in a house virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/E10/E10.html)

11. Complete the activity with the students (some tasks may require students to work independently, peer to peer, learning circles [2-3 students] or as a whole group [the entire class]. Therefore the teacher may serve as activity leader and or facilitator. When an activity calls for students to work in learning circles you should assign roles to students individually i.e. recorder, discussion leader or presenter)

12. At the end of the **\*whole group learning session**, students will transition into independent CAP assignments.

**\*The phrase, “whole group learning session” is utilized “rather than, the end of the activity” because all of the activities may not be completed in one day.**

**Activity**

The teacher and students will complete [How much electricity is used in a house virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/E10/E10.html) as a whole group activity. Students will work in learning circles to complete the journal activity.

The teacher and students will review today’s lesson by completing the [Standardized Test Practice](http://glencoe.mcgraw-hill.com/sites/0078779626/student_view0/unit2/chapter9/standardized_test_practice.html).

**Energy on the Move**

**Georgia Performance Standards:**

**SCSh9. Students will enhance reading in all curriculum areas by:**

c. Building vocabulary knowledge

Demonstrate an understanding of contextual vocabulary in various subjects.

Use content vocabulary in writing and speaking.

Explore understanding of new words found in subject area texts.

**SCSh1. Students will evaluate the importance of curiosity, honesty, openness, and skepticism in science.**

a. Exhibit the above traits in their own scientific activities.

b. Recognize that different explanations often can be given for the same evidence.

c. Explain that further understanding of scientific problems relies on the design and execution of new experiments which may reinforce or weaken opposing explanations.

**SCSh3. Students will identify and investigate problems scientifically.**

c. Collect, organize and record appropriate data.

e. Develop reasonable conclusions based on data collected.

f. Evaluate whether conclusions are reasonable by reviewing the process and checking against other available information.

**SCSh4. Students will use tools and instruments for observing, measuring, and manipulating scientific equipment and materials.**

a. Develop and use systematic procedures for recording and organizing information.

**SPS9. Students will investigate the properties of waves.**

b. Relate frequency and wavelength to the energy of different types of electromagnetic waves and mechanical waves.

c. Compare and contrast the characteristics of electromagnetic and mechanical (sound) waves.

**SCSh5. Students will demonstrate the computation and estimation skills necessary for analyzing data and developing reasonable scientific explanations.**

d. Express appropriate numbers of significant figures for calculated data, using scientific notation where appropriate.

**SCSh7. Students will analyze how scientific knowledge is developed.**

c. From time to time, major shifts occur in the scientific view of how the world works. More often, however, the changes that take place in the body of scientific knowledge are small modifications of prior knowledge. Major shifts in scientific views typically occur after the observation of a new phenomenon or an insightful interpretation of existing data by an individual or research group.

**Task: 1**

**Essential Question:**

What happens to sound as it moves through different media?

What happens when two waves meet while they travel through the same medium?

**Resources:**

[What are some characteristics of waves virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/E05/E05.html)

[Standardized Test Practice](http://glencoe.mcgraw-hill.com/sites/0078779626/student_view0/unit3/chapter10/standardized_test_practice.html)

[Math across the curriculum test item](http://glencoe.mcgraw-hill.com/sites/0078779626/student_view0/unit3/chapter10/math_practice.html)

[Waves virtual lesson](http://glencoe.mcgraw-hill.com/sites/dl/free/0078779626/161383/00053404.html)

**Teacher’s Place:**

Prior to beginning the performance activity, the teacher should implement the following steps using teaching techniques you have found to be effective for your students.

1. Explain the activity (activity requirements)

2. Display the Georgia Performance Standard(s) (project on blackboard via units of instruction located at <http://thevillage411.weebly.com/units-of-instruction2.html> units of instruction page, or print on blackboard)

3. Read the Georgia Performance Standard(s) aloud and explain it to your students. You can rephrase the Georgia Performance Standard to make sure your students understand it.

4. Display the Essential Question(s) (project on blackboard via units of instruction, or print on blackboard)

5. Read the Essential Question (s) aloud and explain it to your students. You can rephrase the Essential Question (s) to make sure your students understand it.

6. Review unit vocabulary with students.

7. Introduce the following:

a. Energy on the Move: Waves p.288

8. Engage students in conversation by asking students the following question: What does light travel through as it goes from the sun to the eyes of an underwater swimmer? Write answers on the blackboard.

9. Discuss answers with the students using the following questioning techniques as applicable:

**Questioning Techniques:**

**Memory Questions**

Signal words: who, what, when, where?

Cognitive operations: naming, defining, identifying, designating

**Convergent Thinking Questions**

Signal words: who, what, when, where?

Cognitive operations: explaining, stating relationships, comparing and

contrasting

**Divergent Thinking Questions**

Signal words: imagine, suppose, predict, if/then

Cognitive operations: predicting, hypothesizing, inferring, reconstructing

**Evaluative Thinking Questions**

Signal words: defend, judge, justify (what do you think)?

10. Guide students into the activity utilizing [What are some characteristics of waves virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/E05/E05.html)

11. Complete the activity with the students (some tasks may require students to work independently, peer to peer, learning circles [2-3 students] or as a whole group [the entire class]. Therefore the teacher may serve as activity leader and or facilitator. When an activity calls for students to work in learning circles you should assign roles to students individually i.e. recorder, discussion leader or presenter)

12. At the end of the **\*whole group learning session**, students will transition into independent CAP assignments.

**\*The phrase, “whole group learning session” is utilized “rather than, the end of the activity” because all of the activities may not be completed in one day.**

**Activity**

The teacher and students will complete [What are some characteristics of waves virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/E05/E05.html) as a whole group activity. Students will work in peer to peer pairs to complete the journal activity.

The teacher and students will review today’s lesson by completing the [Standardized Test Practice](http://glencoe.mcgraw-hill.com/sites/0078779626/student_view0/unit3/chapter10/standardized_test_practice.html).

The teacher and student will complete the [Math across the curriculum test item](http://glencoe.mcgraw-hill.com/sites/0078779626/student_view0/unit3/chapter10/math_practice.html) as a lesson wrap up.

**Task: 2**

**Essential Question:**

What happens to sound as it moves through different media?

What happens when two waves meet while they travel through the same medium?

**Resources:**

[How is an oscilloscope used to tune a musical instrument virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/PS18/PS18.html)

[The Human Ear concept](http://glencoe.mcgraw-hill.com/olcweb/cgi/pluginpop.cgi?it=swf::474::356::/sites/dl/free/0078779626/164037/631_Fig_3.swf::The%20Human%20Ear)

[Standardized Test Practice](http://glencoe.mcgraw-hill.com/sites/0078779626/student_view0/unit3/chapter11/standardized_test_practice.html)

[Math across the curriculum test item](http://glencoe.mcgraw-hill.com/sites/0078779626/student_view0/unit3/chapter11/math_practice.html)

**Teacher’s Place:**

Prior to beginning the performance activity, the teacher should implement the following steps using teaching techniques you have found to be effective for your students.

1. Explain the activity (activity requirements)

2. Display the Georgia Performance Standard(s) (project on blackboard via units of instruction located at <http://thevillage411.weebly.com/units-of-instruction2.html> units of instruction page, or print on blackboard)

3. Read the Georgia Performance Standard(s) aloud and explain it to your students. You can rephrase the Georgia Performance Standard to make sure your students understand it.

4. Display the Essential Question(s) (project on blackboard via units of instruction, or print on blackboard)

5. Read the Essential Question (s) aloud and explain it to your students. You can rephrase the Essential Question (s) to make sure your students understand it.

6. Review unit vocabulary with students.

7. Introduce the following:

a. Energy on the Move: Music p.333

8. Engage students in conversation by asking students the following question: How is music different than noise? Write answers on the blackboard.

9. Discuss answers with the students using the following questioning techniques as applicable:

**Questioning Techniques:**

**Memory Questions**

Signal words: who, what, when, where?

Cognitive operations: naming, defining, identifying, designating

**Convergent Thinking Questions**

Signal words: who, what, when, where?

Cognitive operations: explaining, stating relationships, comparing and

contrasting

**Divergent Thinking Questions**

Signal words: imagine, suppose, predict, if/then

Cognitive operations: predicting, hypothesizing, inferring, reconstructing

**Evaluative Thinking Questions**

Signal words: defend, judge, justify (what do you think)?

10. Guide students into the activity utilizing [How is an oscilloscope used to tune a musical instrument virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/PS18/PS18.html)

11. Complete the activity with the students (some tasks may require students to work independently, peer to peer, learning circles [2-3 students] or as a whole group [the entire class]. Therefore the teacher may serve as activity leader and or facilitator. When an activity calls for students to work in learning circles you should assign roles to students individually i.e. recorder, discussion leader or presenter)

12. At the end of the **\*whole group learning session**, students will transition into independent CAP assignments.

**\*The phrase, “whole group learning session” is utilized “rather than, the end of the activity” because all of the activities may not be completed in one day.**

**Activity**

The teacher and students will complete  [How is an oscilloscope used to tune a musical instrument virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/PS18/PS18.html) as a whole group activity. Students will work in cooperative learning groups to complete the journal activity.

The teacher and students will review today’s lesson by completing the [Standardized Test Practice](http://glencoe.mcgraw-hill.com/sites/0078779626/student_view0/unit3/chapter11/standardized_test_practice.html).

The teacher and student will complete the [Math across the curriculum test item](http://glencoe.mcgraw-hill.com/sites/0078779626/student_view0/unit3/chapter11/math_practice.html) as a lesson wrap up.

**Task: 3**

**Essential Question:**

How is energy transferred from one place to another?

What actually happens during a phase change?

How do light and sound transfer energy from one place to another?

What happens to light as it moves through different media?

What happens to sound as it moves through different media?

What happens when two waves meet while they travel through the same medium?

**Resources:**

[What is the electromagnetic spectrum virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/CT05/CT05.html)

[Ozone Depletion concept](http://glencoe.mcgraw-hill.com/olcweb/cgi/pluginpop.cgi?it=swf::438::361::/sites/dl/free/0078779626/164037/632_Fig_13.swf::Ozone%20Depletion)

[Standardized Test Practice](http://glencoe.mcgraw-hill.com/sites/0078779626/student_view0/unit3/chapter12/standardized_test_practice.html)

[Math across the curriculum test item](http://glencoe.mcgraw-hill.com/sites/0078779626/student_view0/unit3/chapter12/math_practice.html)

**Teacher’s Place:**

Prior to beginning the performance activity, the teacher should implement the following steps using teaching techniques you have found to be effective for your students.

1. Explain the activity (activity requirements)

2. Display the Georgia Performance Standard(s) (project on blackboard via units of instruction located at <http://thevillage411.weebly.com/units-of-instruction2.html> units of instruction page, or print on blackboard)

3. Read the Georgia Performance Standard(s) aloud and explain it to your students. You can rephrase the Georgia Performance Standard to make sure your students understand it.

4. Display the Essential Question(s) (project on blackboard via units of instruction, or print on blackboard)

5. Read the Essential Question (s) aloud and explain it to your students. You can rephrase the Essential Question (s) to make sure your students understand it.

6. Review unit vocabulary with students.

7. Introduce the following:

a. Electromagnetic Waves: Spectrum p.360

8. Engage students in conversation by asking students the following question: What is the difference between a microwave and a radio wave? Write answers on the blackboard.

9. Discuss answers with the students using the following questioning techniques as applicable:

**Questioning Techniques:**

**Memory Questions**

Signal words: who, what, when, where?

Cognitive operations: naming, defining, identifying, designating

**Convergent Thinking Questions**

Signal words: who, what, when, where?

Cognitive operations: explaining, stating relationships, comparing and

contrasting

**Divergent Thinking Questions**

Signal words: imagine, suppose, predict, if/then

Cognitive operations: predicting, hypothesizing, inferring, reconstructing

**Evaluative Thinking Questions**

Signal words: defend, judge, justify (what do you think)?

10. Guide students into the activity utilizing [What is the electromagnetic spectrum virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/CT05/CT05.html)

11. Complete the activity with the students (some tasks may require students to work independently, peer to peer, learning circles [2-3 students] or as a whole group [the entire class]. Therefore the teacher may serve as activity leader and or facilitator. When an activity calls for students to work in learning circles you should assign roles to students individually i.e. recorder, discussion leader or presenter)

12. At the end of the **\*whole group learning session**, students will transition into independent CAP assignments.

**\*The phrase, “whole group learning session” is utilized “rather than, the end of the activity” because all of the activities may not be completed in one day.**

**Activity**

The teacher and students will complete [What is the electromagnetic spectrum virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/CT05/CT05.html) as a whole group activity. Students will work in cooperative learning groups to complete the journal activity.

The teacher and students will review today’s lesson by completing the [Standardized Test Practice](http://glencoe.mcgraw-hill.com/sites/0078779626/student_view0/unit3/chapter12/standardized_test_practice.html).

**Task: 4**

**Essential Question:**

What happens to light as it moves through different media?

What happens when two waves meet while they travel through the same medium?

**Resources:**

[How are colors created virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/PS19/PS19.html)

[Total Internal Reflection concept](http://glencoe.mcgraw-hill.com/olcweb/cgi/pluginpop.cgi?it=swf::500::366::/sites/dl/free/0078779626/164037/633_Fig_23.swf::Total%20Internal%20Reflection)

[Standardized Test Practice](http://glencoe.mcgraw-hill.com/sites/0078779626/student_view0/unit3/chapter13/standardized_test_practice.html)

[Color virtual lesson](http://glencoe.mcgraw-hill.com/sites/dl/free/0078779626/164213/00053401.html)

**Teacher’s Place:**

Prior to beginning the performance activity, the teacher should implement the following steps using teaching techniques you have found to be effective for your students.

1. Explain the activity (activity requirements)

2. Display the Georgia Performance Standard(s) (project on blackboard via units of instruction located at <http://thevillage411.weebly.com/units-of-instruction2.html> units of instruction page, or print on blackboard)

3. Read the Georgia Performance Standard(s) aloud and explain it to your students. You can rephrase the Georgia Performance Standard to make sure your students understand it.

4. Display the Essential Question(s) (project on blackboard via units of instruction, or print on blackboard)

5. Read the Essential Question (s) aloud and explain it to your students. You can rephrase the Essential Question (s) to make sure your students understand it.

6. Review unit vocabulary with students.

7. Introduce the following:

a. Light: Producing Light p.394

8. Engage students in conversation by asking students the following question: What are some sources of light pollution? Write answers on the blackboard.

9. Discuss answers with the students using the following questioning techniques as applicable:

**Questioning Techniques:**

**Memory Questions**

Signal words: who, what, when, where?

Cognitive operations: naming, defining, identifying, designating

**Convergent Thinking Questions**

Signal words: who, what, when, where?

Cognitive operations: explaining, stating relationships, comparing and

contrasting

**Divergent Thinking Questions**

Signal words: imagine, suppose, predict, if/then

Cognitive operations: predicting, hypothesizing, inferring, reconstructing

**Evaluative Thinking Questions**

Signal words: defend, judge, justify (what do you think)?

10. Guide students into the activity utilizing [How are colors created virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/PS19/PS19.html)

11. Complete the activity with the students (some tasks may require students to work independently, peer to peer, learning circles [2-3 students] or as a whole group [the entire class]. Therefore the teacher may serve as activity leader and or facilitator. When an activity calls for students to work in learning circles you should assign roles to students individually i.e. recorder, discussion leader or presenter)

12. At the end of the **\*whole group learning session**, students will transition into independent CAP assignments.

**\*The phrase, “whole group learning session” is utilized “rather than, the end of the activity” because all of the activities may not be completed in one day.**

**Activity**

The teacher and students will complete [How are colors created virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/PS19/PS19.html) as a whole group activity. Students will complete the journal activity as a ticket out the door.

**The Nature of Matter**

**Georgia Performance Standards:**

**SCSh1. Students will evaluate the importance of curiosity, honesty, openness, and skepticism in science.**

a. Exhibit the above traits in their own scientific activities.

b. Recognize that different explanations often can be given for the same evidence.

c. Explain that further understanding of scientific problems relies on the design and execution of new experiments which may reinforce or weaken opposing explanations.

**SCSh3. Students will identify and investigate problems scientifically.**

c. Collect, organize and record appropriate data.

e. Develop reasonable conclusions based on data collected.

f. Evaluate whether conclusions are reasonable by reviewing the process and checking against other available information.

**SCSh4. Students will use tools and instruments for observing, measuring, and manipulating scientific equipment and materials.**

a. Develop and use systematic procedures for recording and organizing information.

**SCSh9. Students will enhance reading in all curriculum areas by:**

c. Building vocabulary knowledge

Demonstrate an understanding of contextual vocabulary in various subjects.

Use content vocabulary in writing and speaking.

Explore understanding of new words found in subject area texts.

**SPS5. Students will compare and contrast the phases of matter as they relate to atomic and molecular motion.**

a. Compare and contrast the atomic/molecular motion of solids, liquids, gases and plasmas.

**SPS4. Students will investigate the arrangement of the Periodic Table.**

a. Determine the trends of the following:

Number of valence electrons

Types of ions formed by representative elements Location of metals, nonmetals, and metalloids Phases at room temperature

b. Use the Periodic Table to predict the above properties for representative elements.

**SCSh7. Students will analyze how scientific knowledge is developed.**

Students will recognize that:

c. From time to time, major shifts occur in the scientific view of how the world works. More often, however, the changes that take place in the body of scientific knowledge are small modifications of prior knowledge. Major shifts in scientific views typically occur after the observation of a new phenomenon or an insightful interpretation of existing data by an individual or research group.

**Task: 1**

**Essential Question:**

How do the subatomic particles of an atom affect its characteristics?

How would the mass of a 10-g sample of carbon-14 change after one half life?

How does knowing trends on the Periodic Table help scientists predict properties of the representative elements?

Why do some atoms gain electrons while others lose them in chemical reactions?

**Resources:**

[How can molecular models be built virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/E02/E02.html)

[Standardized Test Practice](http://glencoe.mcgraw-hill.com/sites/0078779626/student_view0/unit4/chapter15/standardized_test_practice.html)

[Math across the curriculum test item](http://glencoe.mcgraw-hill.com/sites/0078779626/student_view0/unit4/chapter15/math_practice.html)

[Chapter 15 quick check](http://glencoe.mcgraw-hill.com/sites/0078779626/student_view0/unit4/chapter15/section_1_self-check_quiz-eng_.html)

[Matter crossword puzzle](http://glencoe.mcgraw-hill.com/sites/dl/free/0078779626/164060/index.html)

**Teacher’s Place:**

Prior to beginning the performance activity, the teacher should implement the following steps using teaching techniques you have found to be effective for your students.

1. Explain the activity (activity requirements)

2. Display the Georgia Performance Standard(s) (project on blackboard via units of instruction located at <http://thevillage411.weebly.com/units-of-instruction2.html> units of instruction page, or print on blackboard)

3. Read the Georgia Performance Standard(s) aloud and explain it to your students. You can rephrase the Georgia Performance Standard to make sure your students understand it.

4. Display the Essential Question(s) (project on blackboard via units of instruction, or print on blackboard)

5. Read the Essential Question (s) aloud and explain it to your students. You can rephrase the Essential Question (s) to make sure your students understand it.

6. Review unit vocabulary with students.

7. Introduce the following:

a. The Nature of Matter: Composition of Matter p.450

8. Engage students in conversation by asking students the following question: What are some components of air? Write answers on the blackboard.

9. Discuss answers with the students using the following questioning techniques as applicable:

**Questioning Techniques:**

**Memory Questions**

Signal words: who, what, when, where?

Cognitive operations: naming, defining, identifying, designating

**Convergent Thinking Questions**

Signal words: who, what, when, where?

Cognitive operations: explaining, stating relationships, comparing and

contrasting

**Divergent Thinking Questions**

Signal words: imagine, suppose, predict, if/then

Cognitive operations: predicting, hypothesizing, inferring, reconstructing

**Evaluative Thinking Questions**

Signal words: defend, judge, justify (what do you think)?

10. Guide students into the activity utilizing [How can molecular models be built virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/E02/E02.html)

11. Complete the activity with the students (some tasks may require students to work independently, peer to peer, learning circles [2-3 students] or as a whole group [the entire class]. Therefore the teacher may serve as activity leader and or facilitator. When an activity calls for students to work in learning circles you should assign roles to students individually i.e. recorder, discussion leader or presenter)

12. At the end of the **\*whole group learning session**, students will transition into independent CAP assignments.

**\*The phrase, “whole group learning session” is utilized “rather than, the end of the activity” because all of the activities may not be completed in one day.**

**Activity**

The teacher and students will complete [How can molecular models be built virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/E02/E02.html)

as a whole group activity. Students will complete the journal activity as a ticket out the door.

The teacher and students will review today’s lesson by completing the [Chapter 15 quick check](http://glencoe.mcgraw-hill.com/sites/0078779626/student_view0/unit4/chapter15/section_1_self-check_quiz-eng_.html).

**Task: 2**

**Essential Question:**

How do the subatomic particles of an atom affect its characteristics?

How would the mass of a 10-g sample of carbon-14 change after one half life?

How does knowing trends on the Periodic Table help scientists predict properties of the representative elements?

Why do some atoms gain electrons while others lose them in chemical reactions?

If an atom loses an electron, why would the resulting particle have a positive charge?

**Resources:**

[What factors influence the pressure of a gas in a container virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/PS08/PS08.html)

[Math across the curriculum test item](http://glencoe.mcgraw-hill.com/sites/0078779626/student_view0/unit4/chapter16/math_practice_1.html)

[Chapter 16 section 1 quick check](http://glencoe.mcgraw-hill.com/sites/0078779626/student_view0/unit4/chapter16/section_1_self-check_quiz-eng_.html)

[Standardized Test Practice](http://glencoe.mcgraw-hill.com/sites/0078779626/student_view0/unit4/chapter16/standardized_test_practice.html)

[Kinetic energy virtual lesson](http://glencoe.mcgraw-hill.com/sites/dl/free/0078779626/161752/00035806.html)

**Teacher’s Place:**

Prior to beginning the performance activity, the teacher should implement the following steps using teaching techniques you have found to be effective for your students.

1. Explain the activity (activity requirements)

2. Display the Georgia Performance Standard(s) (project on blackboard via units of instruction located at <http://thevillage411.weebly.com/units-of-instruction2.html> units of instruction page, or print on blackboard)

3. Read the Georgia Performance Standard(s) aloud and explain it to your students. You can rephrase the Georgia Performance Standard to make sure your students understand it.

4. Display the Essential Question(s) (project on blackboard via units of instruction, or print on blackboard)

5. Read the Essential Question (s) aloud and explain it to your students. You can rephrase the Essential Question (s) to make sure your students understand it.

6. Review unit vocabulary with students.

7. Introduce the following:

a. Solids, liquids, and gases: Kinetic Energy p.476

8. Engage students in conversation by asking students the following question: What happens to molecules of water as ice melts? Write answers on the blackboard.

9. Discuss answers with the students using the following questioning techniques as applicable:

**Questioning Techniques:**

**Memory Questions**

Signal words: who, what, when, where?

Cognitive operations: naming, defining, identifying, designating

**Convergent Thinking Questions**

Signal words: who, what, when, where?

Cognitive operations: explaining, stating relationships, comparing and

contrasting

**Divergent Thinking Questions**

Signal words: imagine, suppose, predict, if/then

Cognitive operations: predicting, hypothesizing, inferring, reconstructing

**Evaluative Thinking Questions**

Signal words: defend, judge, justify (what do you think)?

10. Guide students into the activity utilizing [What factors influence the pressure of a gas in a container virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/PS08/PS08.html)

11. Complete the activity with the students (some tasks may require students to work independently, peer to peer, learning circles [2-3 students] or as a whole group [the entire class]. Therefore the teacher may serve as activity leader and or facilitator. When an activity calls for students to work in learning circles you should assign roles to students individually i.e. recorder, discussion leader or presenter)

12. At the end of the **\*whole group learning session**, students will transition into independent CAP assignments.

**\*The phrase, “whole group learning session” is utilized “rather than, the end of the activity” because all of the activities may not be completed in one day.**

**Activity**

The teacher and students will complete [What factors influence the pressure of a gas in a container virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/PS08/PS08.html) as a whole group activity. Students will work in cooperative learning groups to complete the journal activity.

The teacher and students will review today’s lesson by completing the [Chapter 16 section 1 quick check](http://glencoe.mcgraw-hill.com/sites/0078779626/student_view0/unit4/chapter16/section_1_self-check_quiz-eng_.html).

**Task: 3**

**Essential Question:**

How do the subatomic particles of an atom affect its characteristics?

How would the mass of a 10-g sample of carbon-14 change after one half life?

In what ways does nuclear radiation affect living things?

If there were an ionizing radiation leak in this room, how would you shield yourself?

How can nuclear radiation be both dangerous and beneficial to humans?

How does knowing trends on the Periodic Table help scientists predict properties of the representative elements?

Why do some atoms gain electrons while others lose them in chemical reactions?

If an atom loses an electron, why would the resulting particle have a positive charge?

**Resources:**

[How is an atom's structure related to its position on the periodic table virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/E19/E19.html)

[The Periodic Table concept](http://glencoe.mcgraw-hill.com/olcweb/cgi/pluginpop.cgi?it=swf::520::356::/sites/dl/free/0078779626/164037/610_Periodic_Table.swf::The%20Periodic%20Table)

[Concentration game](http://glencoe.mcgraw-hill.com/sites/dl/free/0078779626/164062/index.html)

[Standardized Test Practice](http://glencoe.mcgraw-hill.com/sites/0078779626/student_view0/unit4/chapter17/standardized_test_practice.html)

**Teacher’s Place:**

Prior to beginning the performance activity, the teacher should implement the following steps using teaching techniques you have found to be effective for your students.

1. Explain the activity (activity requirements)

2. Display the Georgia Performance Standard(s) (project on blackboard via units of instruction located at <http://thevillage411.weebly.com/units-of-instruction2.html> units of instruction page, or print on blackboard)

3. Read the Georgia Performance Standard(s) aloud and explain it to your students. You can rephrase the Georgia Performance Standard to make sure your students understand it.

4. Display the Essential Question(s) (project on blackboard via units of instruction, or print on blackboard)

5. Read the Essential Question (s) aloud and explain it to your students. You can rephrase the Essential Question (s) to make sure your students understand it.

6. Review unit vocabulary with students.

7. Introduce the following:

a. Properties of Atoms and the Periodic Table: The Periodic Table p.516

8. Engage students in conversation by asking students the following question: Of what material is glass usually made? Write answers on the blackboard.

9. Discuss answers with the students using the following questioning techniques as applicable:

**Questioning Techniques:**

**Memory Questions**

Signal words: who, what, when, where?

Cognitive operations: naming, defining, identifying, designating

**Convergent Thinking Questions**

Signal words: who, what, when, where?

Cognitive operations: explaining, stating relationships, comparing and

contrasting

**Divergent Thinking Questions**

Signal words: imagine, suppose, predict, if/then

Cognitive operations: predicting, hypothesizing, inferring, reconstructing

**Evaluative Thinking Questions**

Signal words: defend, judge, justify (what do you think)?

10. Guide students into the activity utilizing [How is an atom's structure related to its position on the periodic table virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/E19/E19.html)

11. Complete the activity with the students (some tasks may require students to work independently, peer to peer, learning circles [2-3 students] or as a whole group [the entire class]. Therefore the teacher may serve as activity leader and or facilitator. When an activity calls for students to work in learning circles you should assign roles to students individually i.e. recorder, discussion leader or presenter)

12. At the end of the **\*whole group learning session**, students will transition into independent CAP assignments.

**\*The phrase, “whole group learning session” is utilized “rather than, the end of the activity” because all of the activities may not be completed in one day.**

**Activity**

The teacher and students will complete [How is an atom's structure related to its position on the periodic table virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/E19/E19.html) as a whole group activity. Students will work in cooperative learning groups to complete the journal activity.

The teacher and students will review today’s lesson by playing the [Concentration game](http://glencoe.mcgraw-hill.com/sites/dl/free/0078779626/164062/index.html).

**Task: 4**

**Essential Question:**

How do the subatomic particles of an atom affect its characteristics?

How would the mass of a 10-g sample of carbon-14 change after one half life?

In what ways does nuclear radiation affect living things?

If there were an ionizing radiation leak in this room, how would you shield yourself?

How can nuclear radiation be both dangerous and beneficial to humans?

How does knowing trends on the Periodic Table help scientists predict properties of the representative elements?

Why do some atoms gain electrons while others lose them in chemical reactions?

If an atom loses an electron, why would the resulting particle have a positive charge?

**Resources:**

[How can you simulate the radioactive half-life of an element virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/E18/E18.html)

[Nuclear Fission Concept](http://glencoe.mcgraw-hill.com/olcweb/cgi/pluginpop.cgi?it=swf::470::305::/sites/dl/free/0078779626/164037/624_16.swf::Nuclear%20Fission)

[Math across the curriculum test item](http://glencoe.mcgraw-hill.com/sites/0078779626/student_view0/unit4/chapter18/math_practice.html)

[Standardized Test Practice](http://glencoe.mcgraw-hill.com/sites/0078779626/student_view0/unit4/chapter18/standardized_test_practice.html)

[Concentration game](http://glencoe.mcgraw-hill.com/sites/dl/free/0078779626/164063/index.html)

**Teacher’s Place:**

Prior to beginning the performance activity, the teacher should implement the following steps using teaching techniques you have found to be effective for your students.

1. Explain the activity (activity requirements)

2. Display the Georgia Performance Standard(s) (project on blackboard via units of instruction located at <http://thevillage411.weebly.com/units-of-instruction2.html> units of instruction page, or print on blackboard)

3. Read the Georgia Performance Standard(s) aloud and explain it to your students. You can rephrase the Georgia Performance Standard to make sure your students understand it.

4. Display the Essential Question(s) (project on blackboard via units of instruction, or print on blackboard)

5. Read the Essential Question (s) aloud and explain it to your students. You can rephrase the Essential Question (s) to make sure your students understand it.

6. Review unit vocabulary with students.

7. Introduce the following:

a. Radioactivity and Nuclear Reaction: Radioactivity p.536

8. Engage students in conversation by asking students the following question: What causes the attraction between protons and neutrons? Write answers on the blackboard.

9. Discuss answers with the students using the following questioning techniques as applicable:

**Questioning Techniques:**

**Memory Questions**

Signal words: who, what, when, where?

Cognitive operations: naming, defining, identifying, designating

**Convergent Thinking Questions**

Signal words: who, what, when, where?

Cognitive operations: explaining, stating relationships, comparing and

contrasting

**Divergent Thinking Questions**

Signal words: imagine, suppose, predict, if/then

Cognitive operations: predicting, hypothesizing, inferring, reconstructing

**Evaluative Thinking Questions**

Signal words: defend, judge, justify (what do you think)?

10. Guide students into the activity utilizing [How can you simulate the radioactive half-life of an element virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/E18/E18.html)

11. Complete the activity with the students (some tasks may require students to work independently, peer to peer, learning circles [2-3 students] or as a whole group [the entire class]. Therefore the teacher may serve as activity leader and or facilitator. When an activity calls for students to work in learning circles you should assign roles to students individually i.e. recorder, discussion leader or presenter)

12. At the end of the **\*whole group learning session**, students will transition into independent CAP assignments.

**\*The phrase, “whole group learning session” is utilized “rather than, the end of the activity” because all of the activities may not be completed in one day.**

**Activity**

The teacher and students will complete [How can you simulate the radioactive half-life of an element virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/E18/E18.html) as a whole group activity. Students will work in cooperative learning groups to complete the journal activity.

The teacher and students will review today’s lesson by playing the [Concentration game](http://glencoe.mcgraw-hill.com/sites/dl/free/0078779626/164063/index.html).

The teacher and student will complete the [Math across the curriculum test item](http://glencoe.mcgraw-hill.com/sites/0078779626/student_view0/unit4/chapter18/math_practice.html) as a whole group activity.

**Diversity of Matter**

**Georgia Performance Standards:**

**SCSh1. Students will evaluate the importance of curiosity, honesty, openness, and skepticism in science.**

a. Exhibit the above traits in their own scientific activities.

b. Recognize that different explanations often can be given for the same evidence.

c. Explain that further understanding of scientific problems relies on the design and execution of new experiments which may reinforce or weaken opposing explanations.

**SCSh3. Students will identify and investigate problems scientifically.**

c. Collect, organize and record appropriate data.

e. Develop reasonable conclusions based on data collected.

f. Evaluate whether conclusions are reasonable by reviewing the process and checking against other available information.

**SCSh4. Students will use tools and instruments for observing, measuring, and manipulating scientific equipment and materials.**

a. Develop and use systematic procedures for recording and organizing information.

**SCSh9. Students will enhance reading in all curriculum areas by:**

c. Building vocabulary knowledge

Demonstrate an understanding of contextual vocabulary in various subjects.

Use content vocabulary in writing and speaking.

Explore understanding of new words found in subject area texts.

**SPS2. Students will explore the nature of matter, its classifications, and its system for naming types of matter.**

a. Calculate density when given a means to determine a substance’s mass and volume.

b. Predict formulas for stable binary ionic compounds based on balance of charges.

c. Use IUPAC nomenclature for transition between chemical names and chemical formulas of binary ionic compounds (containing representative elements).

binary covalent compounds (i.e. carbon dioxide, carbon tetrachloride).

d. Demonstrate the Law of Conservation of Matter in a chemical reaction.

e. Apply the Law of Conservation of Matter by balancing the following types of chemical equations: Synthesis Decomposition Single Replacement Double Replacement

**SPS4. Students will investigate the arrangement of the Periodic Table.**

a. Determine the trends of the following:

Number of valence electrons Types of ions formed by representative elements Location of metals, nonmetals, and metalloids Phases at room temperature

**Task: 1**

**Essential Question:**

How do the subatomic particles of an atom affect its characteristics?

How would the mass of a 10-g sample of carbon-14 change after one half life?

In what ways does nuclear radiation affect living things?

If there were an ionizing radiation leak in this room, how would you shield yourself?

How can nuclear radiation be both dangerous and beneficial to humans?

How does knowing trends on the Periodic Table help scientists predict properties of the representative elements?

Why do some atoms gain electrons while others lose them in chemical reactions?

If an atom loses an electron, why would the resulting particle have a positive charge?

**Resources:**

[What properties to elements have virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/E21/E21.html)

[Elements in the Human Body concept](http://glencoe.mcgraw-hill.com/olcweb/cgi/pluginpop.cgi?it=swf::412::356::/sites/dl/free/0078779626/164037/612_Fig_10.swf::Elements%20in%20the%20Human%20Body)

[Math across the curriculum test item](http://glencoe.mcgraw-hill.com/sites/0078779626/student_view0/unit5/chapter19/math_practice.html)

[Drag and Drop Puzzle](http://glencoe.mcgraw-hill.com/olcweb/cgi/pluginpop.cgi?it=dcr::592::370::/sites/dl/free/0078779626/164064/612.dcr::Drag%20And%20Drop%20Puzzle)

**Teacher’s Place:**

Prior to beginning the performance activity, the teacher should implement the following steps using teaching techniques you have found to be effective for your students.

1. Explain the activity (activity requirements)

2. Display the Georgia Performance Standard(s) (project on blackboard via units of instruction located at <http://thevillage411.weebly.com/units-of-instruction2.html> units of instruction page, or print on blackboard)

3. Read the Georgia Performance Standard(s) aloud and explain it to your students. You can rephrase the Georgia Performance Standard to make sure your students understand it.

4. Display the Essential Question(s) (project on blackboard via units of instruction, or print on blackboard)

5. Read the Essential Question (s) aloud and explain it to your students. You can rephrase the Essential Question (s) to make sure your students understand it.

6. Review unit vocabulary with students.

7. Introduce the following:

a. Elements and their properties: Metals and Nonmetals p.570 & 578

8. Engage students in conversation by asking students the following question: What properties do elements have? Write answers on the blackboard.

9. Discuss answers with the students using the following questioning techniques as applicable:

**Questioning Techniques:**

**Memory Questions**

Signal words: who, what, when, where?

Cognitive operations: naming, defining, identifying, designating

**Convergent Thinking Questions**

Signal words: who, what, when, where?

Cognitive operations: explaining, stating relationships, comparing and

contrasting

**Divergent Thinking Questions**

Signal words: imagine, suppose, predict, if/then

Cognitive operations: predicting, hypothesizing, inferring, reconstructing

**Evaluative Thinking Questions**

Signal words: defend, judge, justify (what do you think)?

10. Guide students into the activity utilizing [What properties to elements have virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/E21/E21.html)

11. Complete the activity with the students (some tasks may require students to work independently, peer to peer, learning circles [2-3 students] or as a whole group [the entire class]. Therefore the teacher may serve as activity leader and or facilitator. When an activity calls for students to work in learning circles you should assign roles to students individually i.e. recorder, discussion leader or presenter)

12. At the end of the **\*whole group learning session**, students will transition into independent CAP assignments.

**\*The phrase, “whole group learning session” is utilized “rather than, the end of the activity” because all of the activities may not be completed in one day.**

**Activity**

The teacher and students will complete [What properties to elements have virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/E21/E21.html)

as a whole group activity. Students will complete the journal activity independently.

The teacher and students will review today’s lesson by completing the [Drag and Drop Puzzle](http://glencoe.mcgraw-hill.com/olcweb/cgi/pluginpop.cgi?it=dcr::592::370::/sites/dl/free/0078779626/164064/612.dcr::Drag%20And%20Drop%20Puzzle).

**Task: 2**

**Essential Question:**

How do we know if a chemical reaction has occurred?

How does atomic structure relate to bonding patterns?

How is the valence of the atom determined?

Why do chemists need a system for naming and writing compounds?

Why do we need to balance chemical equations?

What happens if an equal number of hydrogen ions and hydroxide ions are in a solution?

How does our understanding of the properties of acids and bases help us in our everyday lives?

How does our understanding of the properties of solutions help us in our everyday lives?

How are solutions different from compounds?

**Resources:**

[How can you tell which elements form chemical bonds virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/E20/E20.html)

[Math across the curriculum test item](http://glencoe.mcgraw-hill.com/sites/0078779626/student_view0/unit5/chapter20/math_practice.html)

[Standardized Test Practice](http://glencoe.mcgraw-hill.com/sites/0078779626/student_view0/unit5/chapter20/standardized_test_practice.html)

**Teacher’s Place:**

Prior to beginning the performance activity, the teacher should implement the following steps using teaching techniques you have found to be effective for your students.

1. Explain the activity (activity requirements)

2. Display the Georgia Performance Standard(s) (project on blackboard via units of instruction located at <http://thevillage411.weebly.com/units-of-instruction2.html> units of instruction page, or print on blackboard)

3. Read the Georgia Performance Standard(s) aloud and explain it to your students. You can rephrase the Georgia Performance Standard to make sure your students understand it.

4. Display the Essential Question(s) (project on blackboard via units of instruction, or print on blackboard)

5. Read the Essential Question (s) aloud and explain it to your students. You can rephrase the Essential Question (s) to make sure your students understand it.

6. Review unit vocabulary with students.

7. Introduce the following:

a. Chemical Bonds: Types of Bonds p.608

8. Engage students in conversation by asking students the following question: What does a chemical formula tell you? Write answers on the blackboard.

9. Discuss answers with the students using the following questioning techniques as applicable:

**Questioning Techniques:**

**Memory Questions**

Signal words: who, what, when, where?

Cognitive operations: naming, defining, identifying, designating

**Convergent Thinking Questions**

Signal words: who, what, when, where?

Cognitive operations: explaining, stating relationships, comparing and

contrasting

**Divergent Thinking Questions**

Signal words: imagine, suppose, predict, if/then

Cognitive operations: predicting, hypothesizing, inferring, reconstructing

**Evaluative Thinking Questions**

Signal words: defend, judge, justify (what do you think)?

10. Guide students into the activity utilizing [How can you tell which elements form chemical bonds virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/E20/E20.html)

11. Complete the activity with the students (some tasks may require students to work independently, peer to peer, learning circles [2-3 students] or as a whole group [the entire class]. Therefore the teacher may serve as activity leader and or facilitator. When an activity calls for students to work in learning circles you should assign roles to students individually i.e. recorder, discussion leader or presenter)

12. At the end of the **\*whole group learning session**, students will transition into independent CAP assignments.

**\*The phrase, “whole group learning session” is utilized “rather than, the end of the activity” because all of the activities may not be completed in one day.**

**Activity**

The teacher and students will complete [How can you tell which elements form chemical bonds virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/E20/E20.html) as a whole group activity. Students will complete the journal activity independently.

The teacher and students will review today’s lesson by completing [Standardized Test Practice](http://glencoe.mcgraw-hill.com/sites/0078779626/student_view0/unit5/chapter20/standardized_test_practice.html).

**Task: 3**

**Essential Question:**

How do we know if a chemical reaction has occurred?

How does atomic structure relate to bonding patterns?

What happens if an equal number of hydrogen ions and hydroxide ions are in a solution?

How does our understanding of the properties of solutions help us in our everyday lives?

How are solutions different from compounds?

How does changing the relative proportions of a solute and solvent affect a solution?

How is solubility affected by physical factors such as pressure, temperature, particle size, and agitation?

**Resources:**

[What is a balanced chemical equation virtual lab](http://www.glencoe.com/sites/common_assets/science/virtual_labs/PS16/PS16.html)

[Game of concentration](http://glencoe.mcgraw-hill.com/sites/dl/free/0078779626/164066/index.html)

[Nomenclature virtual concept](http://glencoe.mcgraw-hill.com/olcweb/cgi/pluginpop.cgi?it=swf::573::356::/sites/dl/free/0078779626/164037/616_Fig_3.swf::Nomenclature)

[Standardized Test Practice](http://glencoe.mcgraw-hill.com/sites/0078779626/student_view0/unit5/chapter21/standardized_test_practice.html)

[Math across the curriculum test item](http://glencoe.mcgraw-hill.com/sites/0078779626/student_view0/unit5/chapter21/math_practice.html)

**Teacher’s Place:**

Prior to beginning the performance activity, the teacher should implement the following steps using teaching techniques you have found to be effective for your students.

1. Explain the activity (activity requirements)

2. Display the Georgia Performance Standard(s) (project on blackboard via units of instruction located at <http://thevillage411.weebly.com/units-of-instruction2.html> units of instruction page, or print on blackboard)

3. Read the Georgia Performance Standard(s) aloud and explain it to your students. You can rephrase the Georgia Performance Standard to make sure your students understand it.

4. Display the Essential Question(s) (project on blackboard via units of instruction, or print on blackboard)

5. Read the Essential Question (s) aloud and explain it to your students. You can rephrase the Essential Question (s) to make sure your students understand it.

6. Review unit vocabulary with students.

7. Introduce the following:

a. Chemical Reactions: Chemical Equations p.637

8. Engage students in conversation by asking students the following question: How is the arrow in a chemical equation like the fulcrum of a balance? Write answers on the blackboard.

9. Discuss answers with the students using the following questioning techniques as applicable:

**Questioning Techniques:**

**Memory Questions**

Signal words: who, what, when, where?

Cognitive operations: naming, defining, identifying, designating

**Convergent Thinking Questions**

Signal words: who, what, when, where?

Cognitive operations: explaining, stating relationships, comparing and

contrasting

**Divergent Thinking Questions**

Signal words: imagine, suppose, predict, if/then

Cognitive operations: predicting, hypothesizing, inferring, reconstructing

**Evaluative Thinking Questions**

Signal words: defend, judge, justify (what do you think)?

10. Guide students into the activity utilizing [What is a balanced chemical equation virtual lab](http://www.glencoe.com/sites/common_assets/science/virtual_labs/PS16/PS16.html)

11. Complete the activity with the students (some tasks may require students to work independently, peer to peer, learning circles [2-3 students] or as a whole group [the entire class]. Therefore the teacher may serve as activity leader and or facilitator. When an activity calls for students to work in learning circles you should assign roles to students individually i.e. recorder, discussion leader or presenter)

12. At the end of the **\*whole group learning session**, students will transition into independent CAP assignments.

**\*The phrase, “whole group learning session” is utilized “rather than, the end of the activity” because all of the activities may not be completed in one day.**

**Activity**

The teacher and students will complete [What is a balanced chemical equation virtual lab](http://www.glencoe.com/sites/common_assets/science/virtual_labs/PS16/PS16.html)

as a whole group activity. Students will complete the journal activity independently.

The teacher and students will review today’s lesson by playing the [Game of concentration](http://glencoe.mcgraw-hill.com/sites/dl/free/0078779626/164066/index.html) as a whole group activity.

The teacher and student will complete the [Math across the curriculum test item](http://glencoe.mcgraw-hill.com/sites/0078779626/student_view0/unit5/chapter21/math_practice.html).

**Interactions of Matter**

**Georgia Performance Standards:**

**SCSh1. Students will evaluate the importance of curiosity, honesty, openness, and skepticism in science.**

a. Exhibit the above traits in their own scientific activities.

b. Recognize that different explanations often can be given for the same evidence.

**SCSh3. Students will identify and investigate problems scientifically.**

c. Collect, organize and record appropriate data.

e. Develop reasonable conclusions based on data collected.

f. Evaluate whether conclusions are reasonable by reviewing the process and checking against other available information.

**SCSh4. Students will use tools and instruments for observing, measuring, and manipulating scientific equipment and materials.**

a. Develop and use systematic procedures for recording and organizing information.

**SCSh9. Students will enhance reading in all curriculum areas by:**

c. Building vocabulary knowledge

Demonstrate an understanding of contextual vocabulary in various subjects.

Use content vocabulary in writing and speaking.

Explore understanding of new words found in subject area texts.

**SPS6. Students will investigate the properties of solutions.**

a. Describe solutions in terms of solute/solvent conductivity concentration

b. Observe factors affecting the rate a solute dissolves in a specific solvent.

c. Demonstrate that solubility is related to temperature by constructing a solubility curve.

d. Compare and contrast the components and properties of acids and bases.

e. Determine whether common household substances are acidic, basic, or

**Task: 1**

**Essential Question:**

How do the subatomic particles of an atom affect its characteristics?

How would the mass of a 10-g sample of carbon-14 change after one half life?

In what ways does nuclear radiation affect living things?

If there were an ionizing radiation leak in this room, how would you shield yourself?

How can nuclear radiation be both dangerous and beneficial to humans?

How does knowing trends on the Periodic Table help scientists predict properties of the representative elements?

Why do some atoms gain electrons while others lose them in chemical reactions?

If an atom loses an electron, why would the resulting particle have a positive charge?

**Resources:**

[How is the solubility of a compound determined](http://www.glencoe.com/sites/common_assets/science/virtual_labs/PS15/PS15.html)

[Standardized Test Practice](http://glencoe.mcgraw-hill.com/sites/0078779626/student_view0/unit6/chapter22/standardized_test_practice.html)

[Crossword puzzle](http://glencoe.mcgraw-hill.com/sites/dl/free/0078779626/164067/index.html)

[Math across the curriculum test item](http://glencoe.mcgraw-hill.com/sites/0078779626/student_view0/unit6/chapter22/math_practice.html)

**Teacher’s Place:**

Prior to beginning the performance activity, the teacher should implement the following steps using teaching techniques you have found to be effective for your students.

1. Explain the activity (activity requirements)

2. Display the Georgia Performance Standard(s) (project on blackboard via units of instruction located at <http://thevillage411.weebly.com/units-of-instruction2.html> units of instruction page, or print on blackboard)

3. Read the Georgia Performance Standard(s) aloud and explain it to your students. You can rephrase the Georgia Performance Standard to make sure your students understand it.

4. Display the Essential Question(s) (project on blackboard via units of instruction, or print on blackboard)

5. Read the Essential Question (s) aloud and explain it to your students. You can rephrase the Essential Question (s) to make sure your students understand it.

6. Review unit vocabulary with students.

7. Introduce the following:

a. How Solutions Form: Types of Solutions p.664

8. Engage students in conversation by asking students the following question: What invisible mixture do you depend on every moment of every day? Write answers on the blackboard.

9. Discuss answers with the students using the following questioning techniques as applicable:

**Questioning Techniques:**

**Memory Questions**

Signal words: who, what, when, where?

Cognitive operations: naming, defining, identifying, designating

**Convergent Thinking Questions**

Signal words: who, what, when, where?

Cognitive operations: explaining, stating relationships, comparing and

contrasting

**Divergent Thinking Questions**

Signal words: imagine, suppose, predict, if/then

Cognitive operations: predicting, hypothesizing, inferring, reconstructing

**Evaluative Thinking Questions**

Signal words: defend, judge, justify (what do you think)?

10. Guide students into the activity utilizing [How is the solubility of a compound determined virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/PS15/PS15.html)

11. Complete the activity with the students (some tasks may require students to work independently, peer to peer, learning circles [2-3 students] or as a whole group [the entire class]. Therefore the teacher may serve as activity leader and or facilitator. When an activity calls for students to work in learning circles you should assign roles to students individually i.e. recorder, discussion leader or presenter)

12. At the end of the **\*whole group learning session**, students will transition into independent CAP assignments.

**\*The phrase, “whole group learning session” is utilized “rather than, the end of the activity” because all of the activities may not be completed in one day.**

**Activity**

The teacher and students will complete [How is the solubility of a compound determined virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/PS15/PS15.html) as a whole group activity. Students will work in cooperative learning groups to complete the journal activity.

The teacher and students will review today’s lesson by completing [Standardized Test Practice](http://glencoe.mcgraw-hill.com/sites/0078779626/student_view0/unit6/chapter22/standardized_test_practice.html).

The teacher and student will complete the [Math across the curriculum test item](http://glencoe.mcgraw-hill.com/sites/0078779626/student_view0/unit6/chapter22/math_practice.html).

**Task: 2**

**Essential Question:**

How do the subatomic particles of an atom affect its characteristics?

How would the mass of a 10-g sample of carbon-14 change after one half life?

In what ways does nuclear radiation affect living things?

If there were an ionizing radiation leak in this room, how would you shield yourself?

How can nuclear radiation be both dangerous and beneficial to humans?

How does knowing trends on the Periodic Table help scientists predict properties of the representative elements?

Why do some atoms gain electrons while others lose them in chemical reactions?

If an atom loses an electron, why would the resulting particle have a positive charge?

**Resources:**

[How is the acidic concentration of a solution determined virtual lab](http://www.glencoe.com/sites/common_assets/science/virtual_labs/PS17/PS17.html)

[How a Base is Formed Concept](http://glencoe.mcgraw-hill.com/olcweb/cgi/pluginpop.cgi?it=swf::573::160::/sites/dl/free/0078779626/164037/617_Fig_5_Bottom.swf::How%20a%20Base%20is%20Formed)

[How an Acid is Formed Concept](http://glencoe.mcgraw-hill.com/olcweb/cgi/pluginpop.cgi?it=swf::573::165::/sites/dl/free/0078779626/164037/617_Fig_5_Top.swf::How%20an%20Acid%20is%20Formed)

[Acids and Bases Virtual Lesson](http://glencoe.mcgraw-hill.com/sites/dl/free/0078779626/164037/00053406.html)

[Section Quick Check](http://glencoe.mcgraw-hill.com/sites/0078779626/student_view0/unit6/chapter23/section_2_self-check_quiz-eng_.html)

**Teacher’s Place:**

Prior to beginning the performance activity, the teacher should implement the following steps using teaching techniques you have found to be effective for your students.

1. Explain the activity (activity requirements)

2. Display the Georgia Performance Standard(s) (project on blackboard via units of instruction located at <http://thevillage411.weebly.com/units-of-instruction2.html> units of instruction page, or print on blackboard)

3. Read the Georgia Performance Standard(s) aloud and explain it to your students. You can rephrase the Georgia Performance Standard to make sure your students understand it.

4. Display the Essential Question(s) (project on blackboard via units of instruction, or print on blackboard)

5. Read the Essential Question (s) aloud and explain it to your students. You can rephrase the Essential Question (s) to make sure your students understand it.

6. Review unit vocabulary with students.

7. Introduce the following:

a. Acids, Bases, and Salts: Strength of Acids and Bases p.702

8. Engage students in conversation by asking students the following question: How might acid rain harm living things? Write answers on the blackboard.

9. Discuss answers with the students using the following questioning techniques as applicable:

**Questioning Techniques:**

**Memory Questions**

Signal words: who, what, when, where?

Cognitive operations: naming, defining, identifying, designating

**Convergent Thinking Questions**

Signal words: who, what, when, where?

Cognitive operations: explaining, stating relationships, comparing and

contrasting

**Divergent Thinking Questions**

Signal words: imagine, suppose, predict, if/then

Cognitive operations: predicting, hypothesizing, inferring, reconstructing

**Evaluative Thinking Questions**

Signal words: defend, judge, justify (what do you think)?

10. Guide students into the activity utilizing [How is the acidic concentration of a solution determined virtual lab](http://www.glencoe.com/sites/common_assets/science/virtual_labs/PS17/PS17.html)

11. Complete the activity with the students (some tasks may require students to work independently, peer to peer, learning circles [2-3 students] or as a whole group [the entire class]. Therefore the teacher may serve as activity leader and or facilitator. When an activity calls for students to work in learning circles you should assign roles to students individually i.e. recorder, discussion leader or presenter)

12. At the end of the **\*whole group learning session**, students will transition into independent CAP assignments.

**\*The phrase, “whole group learning session” is utilized “rather than, the end of the activity” because all of the activities may not be completed in one day.**

**Activity**

The teacher and students will complete [How is the acidic concentration of a solution determined virtual lab](http://www.glencoe.com/sites/common_assets/science/virtual_labs/PS17/PS17.html) as a whole group activity. Students will complete the journal activity as a ticket out the door.

The teacher and students will review today’s lesson by completing [Acids and Bases Virtual Lesson](http://glencoe.mcgraw-hill.com/sites/dl/free/0078779626/164037/00053406.html) and the [Section Quick Check](http://glencoe.mcgraw-hill.com/sites/0078779626/student_view0/unit6/chapter23/section_2_self-check_quiz-eng_.html).

**Task: 3**

**Georgia Performance Standards:**

**Essential Question:**

How do the subatomic particles of an atom affect its characteristics?

How would the mass of a 10-g sample of carbon-14 change after one half life?

In what ways does nuclear radiation affect living things?

If there were an ionizing radiation leak in this room, how would you shield yourself?

How can nuclear radiation be both dangerous and beneficial to humans?

How does knowing trends on the Periodic Table help scientists predict properties of the representative elements?

Why do some atoms gain electrons while others lose them in chemical reactions?

If an atom loses an electron, why would the resulting particle have a positive charge?

**Resources:**

[What is the pH of common solutions virtual lab](http://www.glencoe.com/sites/common_assets/science/virtual_labs/E22/E22.html)

[Standardized Test Practice](http://glencoe.mcgraw-hill.com/sites/0078778344/student_view0/chapter3/standardized_test_practice.html)

**Teacher’s Place:**

Prior to beginning the performance activity, the teacher should implement the following steps using teaching techniques you have found to be effective for your students.

1. Explain the activity (activity requirements)

2. Display the Georgia Performance Standard(s) (project on blackboard via units of instruction located at <http://thevillage411.weebly.com/units-of-instruction2.html> units of instruction page, or print on blackboard)

3. Read the Georgia Performance Standard(s) aloud and explain it to your students. You can rephrase the Georgia Performance Standard to make sure your students understand it.

4. Display the Essential Question(s) (project on blackboard via units of instruction, or print on blackboard)

5. Read the Essential Question (s) aloud and explain it to your students. You can rephrase the Essential Question (s) to make sure your students understand it.

6. Review unit vocabulary with students.

7. Review the following:

a. Acids, Bases, and Salts: Strength of Acids and Bases p.702

8. Engage students in conversation by asking students the following question: What are buffers and how are they important for health? Write answers on the blackboard.

9. Discuss answers with the students using the following questioning techniques as applicable:

**Questioning Techniques:**

**Memory Questions**

Signal words: who, what, when, where?

Cognitive operations: naming, defining, identifying, designating

**Convergent Thinking Questions**

Signal words: who, what, when, where?

Cognitive operations: explaining, stating relationships, comparing and

contrasting

**Divergent Thinking Questions**

Signal words: imagine, suppose, predict, if/then

Cognitive operations: predicting, hypothesizing, inferring, reconstructing

**Evaluative Thinking Questions**

Signal words: defend, judge, justify (what do you think)?

10. Guide students into the activity utilizing [What is the pH of common solutions virtual lab](http://www.glencoe.com/sites/common_assets/science/virtual_labs/E22/E22.html)

11. Complete the activity with the students (some tasks may require students to work independently, peer to peer, learning circles [2-3 students] or as a whole group [the entire class]. Therefore the teacher may serve as activity leader and or facilitator. When an activity calls for students to work in learning circles you should assign roles to students individually i.e. recorder, discussion leader or presenter)

12. At the end of the **\*whole group learning session**, students will transition into independent CAP assignments.

**\*The phrase, “whole group learning session” is utilized “rather than, the end of the activity” because all of the activities may not be completed in one day.**

**Activity**

The teacher and students will complete [What is the pH of common solutions virtual lab](http://www.glencoe.com/sites/common_assets/science/virtual_labs/E22/E22.html)

as a whole group activity. Students will work in cooperative learning groups to complete the journal activity.

The teacher and students will review today’s lesson by completing the [Standardized Test Practice](http://glencoe.mcgraw-hill.com/sites/0078778344/student_view0/chapter3/standardized_test_practice.html).

**Task: 4**

**Essential Question:**

How do the subatomic particles of an atom affect its characteristics?

How would the mass of a 10-g sample of carbon-14 change after one half life?

In what ways does nuclear radiation affect living things?

If there were an ionizing radiation leak in this room, how would you shield yourself?

How can nuclear radiation be both dangerous and beneficial to humans?

How does knowing trends on the Periodic Table help scientists predict properties of the representative elements?

Why do some atoms gain electrons while others lose them in chemical reactions?

If an atom loses an electron, why would the resulting particle have a positive charge?

**Resources:**

[What are the energy outputs of different types of fuel virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/PS13/PS13.html)

[How a Fractioning Tower Works Concept](http://glencoe.mcgraw-hill.com/olcweb/cgi/pluginpop.cgi?it=swf::238::356::/sites/dl/free/0078779626/164037/613_Fig_13.swf::How%20a%20Fractioning%20Tower%20Works)

[Standardized Test Practice](http://glencoe.mcgraw-hill.com/sites/0078779626/student_view0/unit6/chapter24/standardized_test_practice.html)

**Teacher’s Place:**

Prior to beginning the performance activity, the teacher should implement the following steps using teaching techniques you have found to be effective for your students.

1. Explain the activity (activity requirements)

2. Display the Georgia Performance Standard(s) (project on blackboard via units of instruction located at <http://thevillage411.weebly.com/units-of-instruction2.html> units of instruction page, or print on blackboard)

3. Read the Georgia Performance Standard(s) aloud and explain it to your students. You can rephrase the Georgia Performance Standard to make sure your students understand it.

4. Display the Essential Question(s) (project on blackboard via units of instruction, or print on blackboard)

5. Read the Essential Question (s) aloud and explain it to your students. You can rephrase the Essential Question (s) to make sure your students understand it.

6. Review unit vocabulary with students.

7. Introduce the following:

a. Organic Compounds: Petroleum-A Source of Carbon Compounds p.736

8. Engage students in conversation by asking students the following question: What everyday products are made from crude oil? Write answers on the blackboard.

9. Discuss answers with the students using the following questioning techniques as applicable:

**Questioning Techniques:**

**Memory Questions**

Signal words: who, what, when, where?

Cognitive operations: naming, defining, identifying, designating

**Convergent Thinking Questions**

Signal words: who, what, when, where?

Cognitive operations: explaining, stating relationships, comparing and

contrasting

**Divergent Thinking Questions**

Signal words: imagine, suppose, predict, if/then

Cognitive operations: predicting, hypothesizing, inferring, reconstructing

**Evaluative Thinking Questions**

Signal words: defend, judge, justify (what do you think)?

10. Guide students into the activity utilizing [What are the energy outputs of different types of fuel virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/PS13/PS13.html)

11. Complete the activity with the students (some tasks may require students to work independently, peer to peer, learning circles [2-3 students] or as a whole group [the entire class]. Therefore the teacher may serve as activity leader and or facilitator. When an activity calls for students to work in learning circles you should assign roles to students individually i.e. recorder, discussion leader or presenter)

12. At the end of the **\*whole group learning session**, students will transition into independent CAP assignments.

**\*The phrase, “whole group learning session” is utilized “rather than, the end of the activity” because all of the activities may not be completed in one day.**

**Activity**

The teacher and students will complete [What are the energy outputs of different types of fuel virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/PS13/PS13.html) as a whole group activity. Students will work in cooperative learning groups to complete the journal activity.

The teacher and students will review today’s lesson by completing the [Standardized Test Practice](http://glencoe.mcgraw-hill.com/sites/0078779626/student_view0/unit6/chapter24/standardized_test_practice.html).

Task Websites

<http://thevillage411.weebly.com/units-of-instruction2.html>

Unit 1

[What is the relationship between distance, speed, and time virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/E12/E12.html)

[Motion of Earths Continents](http://glencoe.mcgraw-hill.com/olcweb/cgi/pluginpop.cgi?it=swf::490::356::/sites/dl/free/0078779626/164037/626_Fig_8.swf::Motion%20of%20Earths%20Continents)

[Describing Motion Quick Check](http://glencoe.mcgraw-hill.com/sites/0078779626/student_view0/unit1/chapter2/section_1_self-check_quiz-eng_.html)

[How does horizontal motion affect vertical motion virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/PS04/PS04.html)

[Acceleration Quick Check](ttp://glencoe.mcgraw-hill.com/sites/0078778360/student_view0/chapter1/section1/self-check_quiz-eng_.html)

[How is momentum conserved in a vehicle collision virtual lab](http://www.glencoe.com/sites/common_assets/science/virtual_labs/E24/E24.html)

[Newton's Laws of Motion Virtual Lesson](http://glencoe.mcgraw-hill.com/sites/dl/free/0078779626/161752/00035803.html)

[Standardized Test Practice](http://glencoe.mcgraw-hill.com/sites/0078778360/student_view0/chapter2/standardized_test_practice.html)

[How is energy converted from one form to another virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/E04/E04.html)

[Standardized Test Practice](http://glencoe.mcgraw-hill.com/sites/0078779626/student_view0/unit1/chapter4/standardized_test_practice.html)

[Energy Transformation virtual concept](http://glencoe.mcgraw-hill.com/olcweb/cgi/pluginpop.cgi?it=swf::573::321::/sites/dl/free/0078779626/164037/628_Fig_8.swf::Energy%20Transformation)

[Math across the science curriculum review item](http://glencoe.mcgraw-hill.com/sites/0078778360/student_view0/chapter2/math_practice.html)

Unit 2

[How are voltage, current, and resistance related virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/E14/E14.html)

[Standardized Test Practice](http://glencoe.mcgraw-hill.com/sites/0078779626/student_view0/unit2/chapter7/standardized_test_practice.html)

[Static Charge Concept](http://glencoe.mcgraw-hill.com/olcweb/cgi/pluginpop.cgi?it=swf::573::205::/sites/dl/free/0078778387/164155/644_Fig_8.swf::Static%20Charge)

[Simple Electric Circuit Concept](http://glencoe.mcgraw-hill.com/olcweb/cgi/pluginpop.cgi?it=swf::402::356::/sites/dl/free/0078778387/164155/644_Fig_11.swf::Simple%20Electric%20Circuit)

[How does a generator work virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/PS22/PS22.html)

[Standardized Test Practice](http://glencoe.mcgraw-hill.com/sites/0078779626/student_view0/unit2/chapter8/standardized_test_practice.html)

[Electric Current concept video lesson](http://glencoe.mcgraw-hill.com/sites/dl/free/0078779626/160350/00076706.html)

[How does a transformer work virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/E15/E15.html)

[Standardized Test Practice](http://glencoe.mcgraw-hill.com/sites/0078778387/student_view0/chapter2/standardized_test_practice.html)

[How much electricity is used in a house virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/E10/E10.html)

[How Electric Gets to Your House virtual concept](http://glencoe.mcgraw-hill.com/olcweb/cgi/pluginpop.cgi?it=swf::573::356::/sites/dl/free/0078617731/164155/645_Fig_19.swf::How%20Electric%20Gets%20to%20Your%20House)

[Geothermal Power Plant Concept](http://glencoe.mcgraw-hill.com/olcweb/cgi/pluginpop.cgi?it=swf::283::356::/sites/dl/free/0078779626/164037/625_Fig_25.swf::Geothermal%20Power%20Plant)

[Standardized Test Practice](http://glencoe.mcgraw-hill.com/sites/0078779626/student_view0/unit2/chapter9/standardized_test_practice.html)

[Chapter 9 Quick Check](http://glencoe.mcgraw-hill.com/sites/0078779626/student_view0/unit2/chapter9/section_1_self-check_quiz-eng_.html)

Unit 3

[What are some characteristics of waves virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/E05/E05.html)

[Standardized Test Practice](http://glencoe.mcgraw-hill.com/sites/0078779626/student_view0/unit3/chapter10/standardized_test_practice.html)

[Math across the curriculum test item](http://glencoe.mcgraw-hill.com/sites/0078779626/student_view0/unit3/chapter10/math_practice.html)

[Waves virtual lesson](http://glencoe.mcgraw-hill.com/sites/dl/free/0078779626/161383/00053404.html)

[How is an oscilloscope used to tune a musical instrument virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/PS18/PS18.html)

[The Human Ear concept](http://glencoe.mcgraw-hill.com/olcweb/cgi/pluginpop.cgi?it=swf::474::356::/sites/dl/free/0078779626/164037/631_Fig_3.swf::The%20Human%20Ear)

[Standardized Test Practice](http://glencoe.mcgraw-hill.com/sites/0078779626/student_view0/unit3/chapter11/standardized_test_practice.html)

[Math across the curriculum test item](http://glencoe.mcgraw-hill.com/sites/0078779626/student_view0/unit3/chapter11/math_practice.html)

[What is the electromagnetic spectrum virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/CT05/CT05.html)

[Ozone Depletion concept](http://glencoe.mcgraw-hill.com/olcweb/cgi/pluginpop.cgi?it=swf::438::361::/sites/dl/free/0078779626/164037/632_Fig_13.swf::Ozone%20Depletion)

[Standardized Test Practice](http://glencoe.mcgraw-hill.com/sites/0078779626/student_view0/unit3/chapter12/standardized_test_practice.html)

[Math across the curriculum test item](http://glencoe.mcgraw-hill.com/sites/0078779626/student_view0/unit3/chapter12/math_practice.html)

[How are colors created virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/PS19/PS19.html)

[Total Internal Reflection concept](http://glencoe.mcgraw-hill.com/olcweb/cgi/pluginpop.cgi?it=swf::500::366::/sites/dl/free/0078779626/164037/633_Fig_23.swf::Total%20Internal%20Reflection)

[Standardized Test Practice](http://glencoe.mcgraw-hill.com/sites/0078779626/student_view0/unit3/chapter13/standardized_test_practice.html)

[Color virtual lesson](http://glencoe.mcgraw-hill.com/sites/dl/free/0078779626/164213/00053401.html)

Unit 4

[How can molecular models be built virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/E02/E02.html)

[Standardized Test Practice](http://glencoe.mcgraw-hill.com/sites/0078779626/student_view0/unit4/chapter15/standardized_test_practice.html)

[Math across the curriculum test item](http://glencoe.mcgraw-hill.com/sites/0078779626/student_view0/unit4/chapter15/math_practice.html)

[Chapter 15 quick check](http://glencoe.mcgraw-hill.com/sites/0078779626/student_view0/unit4/chapter15/section_1_self-check_quiz-eng_.html)

[Matter crossword puzzle](http://glencoe.mcgraw-hill.com/sites/dl/free/0078779626/164060/index.html)

[What factors influence the pressure of a gas in a container virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/PS08/PS08.html)

[Math across the curriculum test item](http://glencoe.mcgraw-hill.com/sites/0078779626/student_view0/unit4/chapter16/math_practice_1.html)

[Chapter 16 section 1 quick check](http://glencoe.mcgraw-hill.com/sites/0078779626/student_view0/unit4/chapter16/section_1_self-check_quiz-eng_.html)

[Standardized Test Practice](http://glencoe.mcgraw-hill.com/sites/0078779626/student_view0/unit4/chapter16/standardized_test_practice.html)

[Kinetic energy virtual lesson](http://glencoe.mcgraw-hill.com/sites/dl/free/0078779626/161752/00035806.html)

[How is an atom's structure related to its position on the periodic table virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/E19/E19.html)

[The Periodic Table concept](http://glencoe.mcgraw-hill.com/olcweb/cgi/pluginpop.cgi?it=swf::520::356::/sites/dl/free/0078779626/164037/610_Periodic_Table.swf::The%20Periodic%20Table)

[Concentration game](http://glencoe.mcgraw-hill.com/sites/dl/free/0078779626/164062/index.html)

[Standardized Test Practice](http://glencoe.mcgraw-hill.com/sites/0078779626/student_view0/unit4/chapter17/standardized_test_practice.html)

[How can you simulate the radioactive half-life of an element virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/E18/E18.html)

[Nuclear Fission Concept](http://glencoe.mcgraw-hill.com/olcweb/cgi/pluginpop.cgi?it=swf::470::305::/sites/dl/free/0078779626/164037/624_16.swf::Nuclear%20Fission)

[Math across the curriculum test item](http://glencoe.mcgraw-hill.com/sites/0078779626/student_view0/unit4/chapter18/math_practice.html)

[Standardized Test Practice](http://glencoe.mcgraw-hill.com/sites/0078779626/student_view0/unit4/chapter18/standardized_test_practice.html)

[Concentration game](http://glencoe.mcgraw-hill.com/sites/dl/free/0078779626/164063/index.html)

Unit 5

[What properties to elements have virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/E21/E21.html)

[Elements in the Human Body concept](http://glencoe.mcgraw-hill.com/olcweb/cgi/pluginpop.cgi?it=swf::412::356::/sites/dl/free/0078779626/164037/612_Fig_10.swf::Elements%20in%20the%20Human%20Body)

[Math across the curriculum test item](http://glencoe.mcgraw-hill.com/sites/0078779626/student_view0/unit5/chapter19/math_practice.html)

[Drag and Drop Puzzle](http://glencoe.mcgraw-hill.com/olcweb/cgi/pluginpop.cgi?it=dcr::592::370::/sites/dl/free/0078779626/164064/612.dcr::Drag%20And%20Drop%20Puzzle)

[How can you tell which elements form chemical bonds virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/E20/E20.html)

[Math across the curriculum test item](http://glencoe.mcgraw-hill.com/sites/0078779626/student_view0/unit5/chapter20/math_practice.html)

[Standardized Test Practice](http://glencoe.mcgraw-hill.com/sites/0078779626/student_view0/unit5/chapter20/standardized_test_practice.html)

[What is a balanced chemical equation virtual lab](http://www.glencoe.com/sites/common_assets/science/virtual_labs/PS16/PS16.html)

[Game of concentration](http://glencoe.mcgraw-hill.com/sites/dl/free/0078779626/164066/index.html)

[Nomenclature virtual concept](http://glencoe.mcgraw-hill.com/olcweb/cgi/pluginpop.cgi?it=swf::573::356::/sites/dl/free/0078779626/164037/616_Fig_3.swf::Nomenclature)

[Standardized Test Practice](http://glencoe.mcgraw-hill.com/sites/0078779626/student_view0/unit5/chapter21/standardized_test_practice.html)

[Math across the curriculum test item](http://glencoe.mcgraw-hill.com/sites/0078779626/student_view0/unit5/chapter21/math_practice.html)

Unit 6

[How is the solubility of a compound determined](http://www.glencoe.com/sites/common_assets/science/virtual_labs/PS15/PS15.html)

[Standardized Test Practice](http://glencoe.mcgraw-hill.com/sites/0078779626/student_view0/unit6/chapter22/standardized_test_practice.html)

[Crossword puzzle](http://glencoe.mcgraw-hill.com/sites/dl/free/0078779626/164067/index.html)

[Math across the curriculum test item](http://glencoe.mcgraw-hill.com/sites/0078779626/student_view0/unit6/chapter22/math_practice.html)

[How is the acidic concentration of a solution determined virtual lab](http://www.glencoe.com/sites/common_assets/science/virtual_labs/PS17/PS17.html)

[How a Base is Formed Concept](http://glencoe.mcgraw-hill.com/olcweb/cgi/pluginpop.cgi?it=swf::573::160::/sites/dl/free/0078779626/164037/617_Fig_5_Bottom.swf::How%20a%20Base%20is%20Formed)

[How an Acid is Formed Concept](http://glencoe.mcgraw-hill.com/olcweb/cgi/pluginpop.cgi?it=swf::573::165::/sites/dl/free/0078779626/164037/617_Fig_5_Top.swf::How%20an%20Acid%20is%20Formed)

[Acids and Bases Virtual Lesson](http://glencoe.mcgraw-hill.com/sites/dl/free/0078779626/164037/00053406.html)

[Section Quick Check](http://glencoe.mcgraw-hill.com/sites/0078779626/student_view0/unit6/chapter23/section_2_self-check_quiz-eng_.html)

[What is the pH of common solutions virtual lab](http://www.glencoe.com/sites/common_assets/science/virtual_labs/E22/E22.html)

[Standardized Test Practice](http://glencoe.mcgraw-hill.com/sites/0078778344/student_view0/chapter3/standardized_test_practice.html)

[What are the energy outputs of different types of fuel virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/PS13/PS13.html)

[How a Fractioning Tower Works Concept](http://glencoe.mcgraw-hill.com/olcweb/cgi/pluginpop.cgi?it=swf::238::356::/sites/dl/free/0078779626/164037/613_Fig_13.swf::How%20a%20Fractioning%20Tower%20Works)

[Standardized Test Practice](http://glencoe.mcgraw-hill.com/sites/0078779626/student_view0/unit6/chapter24/standardized_test_practice.html)