**The Georgia Department of Juvenile Justice**

 **6th Grade 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 6th Grade Earth 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 6th Grade Earth 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 6th Grade Earth 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 3Tier 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 language arts 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 ContentMiddle School | 9th Grade ContentHigh School | 7th Grade ContentMiddle School | 10th Grade ContentHigh School |
| 8th Grade ContentMiddle School | 11th Grade ContentHigh School | 6th Grade ContentMiddle School | 12th Grade Content High School |
| 7th Grade ContentMiddle School | 9th Grade ContentHigh School | 8th Grade ContentMiddle School | 10th Grade ContentHigh School |
| 6th Grade ContentMiddle School | 11th Grade ContentHigh School | 7th Grade ContentMiddle School | 12th Grade ContentHigh School |

**Georgia Performance Standards**

**S6CS1. Students will explore the importance of curiosity, honesty, openness, and skepticism in science and will exhibit these traits in their own efforts to understand how the world works.**

a. Understand the importance of—and keep—honest, clear, and accurate records in science.

b. Understand that hypotheses are valuable if they lead to fruitful investigations, even if the hypotheses turn out not to be completely accurate descriptions.

**S6CS2. 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.

**S6CS3. Students will use computation and estimation skills necessary for analyzing data and following scientific explanations.**

a. Analyze scientific data by using, interpreting, and comparing numbers in several equivalent forms, such as integers and decimals.

b. Use metric input units (such as seconds, meters, or grams per milliliter) of scientific calculations to determine the proper unit for expressing the answer.

c. Address the relationship between accuracy and precision and the importance of each.

d. Draw conclusions based on analyzed data.

**S6CS4. Students will use tools and instruments for observing, measuring, and manipulating equipment and materials in scientific activities.**

a. Use appropriate technology to store and retrieve scientific information in topical, alphabetical, numerical, and keyword files, and create simple files.

b. Estimate the effect of making a change in one part of a system on the system as a whole.

c. Read analog and digital meters on instruments used to make direct measurements of length, volume, weight, elapsed time, rates, and temperature, and choose appropriate units for reporting various quantities.

**S6CS5. Students will use the ideas of system, model, change, and scale in exploring scientific and technological matters.**

a. Observe and explain how parts are related to other parts in systems such as weather systems, solar systems, and ocean systems including how the output from one part of a system (in the form of material, energy, or information) can become the input to other parts. (For example: El Nino’s effect on weather)

b. Identify several different models (such as physical replicas, pictures, and analogies) that could be used to represent the same thing, and evaluate their usefulness, taking into account such things as the model’s purpose and complexity.

**S6CS6. Students will communicate scientific ideas and activities clearly.**

a. Write clear, step-by-step instructions for conducting scientific investigations, operating a piece of equipment, or following a procedure.

b. Understand and describe how writing for scientific purposes is different than writing for literary purposes.

c. Organize scientific information using appropriate tables, charts, and graphs, and identify relationships they reveal.

**S6CS7. Students will question scientific claims and arguments effectively.**

a. Question claims based on vague attributions (such as “Leading doctors say...”) or on statements made by people outside the area of their particular expertise.

b. Recognize that there may be more than one way to interpret a given set of findings.

**S6CS8. Students will investigate the characteristics of scientific knowledge and how it is achieved.**

 a. When similar investigations give different results, the scientific challenge is to judge whether the differences are trivial or significant, which often requires further study. Even with similar results, scientists may wait until an investigation has been repeated many times before accepting the results as meaningful.

b. When new experimental results are inconsistent with an existing, well-established theory, scientists may require further experimentation to decide whether the results are flawed or the theory requires modification.

c. As prevailing theories are challenged by new information, scientific knowledge may change and grow.

**S6CS9. Students will investigate the features of the process of scientific inquiry.**

a. Scientific investigations are conducted for different reasons. They usually involve collecting evidence, reasoning, devising hypotheses, and formulating explanations.

b. Scientists often collaborate to design research. To prevent bias, scientists conduct independent studies of the same questions.

c. Accurate record keeping, data sharing, and replication of results are essential for maintaining an investigator’s credibility with other scientists and society.

d. Scientists use technology and mathematics to enhance the process of scientific inquiry.

e. The ethics of science require that special care must be taken and used for human subjects and animals in scientific research. Scientists must adhere to the appropriate rules and guidelines when conducting research.

**S6CS10. 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.

**S6E1. Students will explore current scientific views of the universe and how those views evolved.**

a. Relate the Nature of Science to the progression of basic historical scientific models (geocentric, heliocentric) as they describe our solar system, and the Big Bang as it describes the formation of the universe.

b. Describe the position of the solar system in the Milky Way galaxy and the universe.

c. Compare and contrast the planets in terms of

Size relative to the earth

Surface and atmospheric features

Relative distance from the sun

Ability to support life

d. Explain the motion of objects in the day/night sky in terms of relative position.

e. Explain that gravity is the force that governs the motion in the solar system.

f. Describe the characteristics of comets, asteroids, and meteors.

**S6E2. Students will understand the effects of the relative positions of the earth, moon and sun.**

a. Demonstrate the phases of the moon by showing the alignment of the earth, moon, and sun.

b. Explain the alignment of the earth, moon, and sun during solar and lunar eclipses.

c. Relate the tilt of the earth to the distribution of sunlight throughout the year and its effect on climate.

**S6E3. Students will recognize the significant role of water in earth processes.**

a. Explain that a large portion of the Earth’s surface is water, consisting of oceans, rivers, lakes, underground water, and ice.

b. Relate various atmospheric conditions to stages of the water cycle.

c. Describe the composition, location, and subsurface topography of the world’s oceans.

d. Explain the causes of waves, currents, and tides.

**S6E4. Students will understand how the distribution of land and oceans affects climate and weather.**

a. Demonstrate that land and water absorb and lose heat at different rates and explain the resulting effects on weather patterns.

b. Relate unequal heating of land and water surfaces to form large global wind systems and weather events such as tornados and thunderstorms.

c. Relate how moisture evaporating from the oceans affects the weather patterns and weather events such as hurricanes.

**S6E5. Students will investigate the scientific view of how the earth’s surface is formed.**

a. Compare and contrast the Earth’s crust, mantle, and core including temperature, density, and composition.

b. Investigate the contribution of minerals to rock composition.

c. Classify rocks by their process of formation.

d. Describe processes that change rocks and the surface of the earth.

e. Recognize that lithospheric plates constantly move and cause major geological events on the earth’s surface.

f. Explain the effects of physical processes (plate tectonics, erosion, deposition, volcanic eruption, gravity) on geological features including oceans (composition, currents, and tides).

g. Describe how fossils show evidence of the changing surface and climate of the Earth.

h. Describe soil as consisting of weathered rocks and decomposed organic material.

i. Explain the effects of human activity on the erosion of the earth’s surface.

j. Describe methods for conserving natural resources such as water, soil, and air.

**S6E6. Students will describe various sources of energy and with their uses and conservation.**

a. Explain the role of the sun as the major source of energy and its relationship to wind and water energy.

b. Identify renewable and nonrenewable resources.

|  |
| --- |
|  DJJ 6th Grade Earth ScienceGeorgia Performance Standards:  Curriculum Map |
| **1st Semester** | **2nd Semester** |
| **Introduction to Earth Science** | **Earth’s Resources** | **The Restless Earth** | **Reshaping the Land** | **Oceanography** | **Weather and Climate** | **Astronomy** |
| **Chapter**1 | **CAPs**1-3 | **Chapter**3  | **CAPs**7-9 | **Chapter**7  | **CAPs** 20-22 | **Chapter** 10 | **CAPs** 29-31 | **Chapter** 13 | **CAPs**38-41 | **Chapter** 15 | **CAPs** 45-47 | **Chapter** 18 | **CAPs** 55-57 |
| 2 | 4-6 | 4 | 10-12 | 8 | 23-25 | 11 | 32-34 | 14 | 42-44 | 16 | 48-51 | 19 | 58-60 |
|  |  | 5 | 13-15 | 9 | 26-28 | 12 | 35-37 |  |  | 17 | 52-54 | 20 | 61-63 |
|  |  | 6 | 16-19 |  |  |  |  |  |  |  |  | 21 | 64-66 |
|  |  |  |  |  |  |  |  |  |  |  |  | 22 | 67-69 |
| **GPS:**S6E1.aS6CS3.bS6CS4.a,cS6CS1.a,bS6CS7.bS6CS8.a,b,cS6CS9.a,c,dS6CS5.b:S6CS2: | **GPS:**S6E5.b,c,e,f,iS6E6.a,bS6CS3.b S6CS5.a,b S6CS6.cS6CS9.a S6CS4.b S6CS8.b,c S6SC10.c,d S6CS1.a | **GPS:**S6E3.b,c S6E5.a,c,d,e,f S6CS3.a,b,dS6CS6.cS6CS8.c S6CS4.a,b S6CS9.a,d S6CS5.aS6CS7.b | **GPS:**S6E5.c,e S6E3.a,b S6CS3.bS6CS4.a S6CS6.c S6CS9.a S6CS5.a S6E5i  | **GPS:**S6E2.c S6E3.a,b,c,d S6E4.aS6E5.c,e,i S6E6.a,bS6CS5.aS6CS3.b S6CS6.b,c S6CS9.a,d S6CS8.c | **GPS:**S6E3bS6E4a,b,c S6E2cS6CS3b S6CS5a S6CS9a,d S6CS4cS6E1fS6E5d | **GPS:**S6E1.a,b,c,d,e,f: S6E2.a,b S6E3.a S6E5.a,d,e S6CS8.c S6CS9.a,d S6CS3.a,b S6CS4S6CS5.a S6CS7.b |
| **Focus CAPs:**3,6 | **Focus CAPs:**9,12,15,19 | **Focus CAPs:**22,25,28 | **Focus CAPs:**31,34,37 | **Focus CAPs:**41,44 | **Focus CAPs:**47,51,54 | **Focus CAPs:**57,60,63,66,69 |

**Enduring Understandings & Essential Question**

**Introduction to Earth Science**

**Enduring Understandings:**

The earth is layered with a partly molten, metallic core; a mantle that though solid, is hot enough to flow; and a colder, rigid lithosphere.

Lithospheric plates on the scales of continents and oceans constantly move.

Major geological events, such as earthquakes, volcanic eruptions, and mountain building, result from these plate motions.

Some changes in the earth’s surface are abrupt (such as earthquakes and volcanic eruptions) while other changes happen very slowly (such as uplift and wearing down of mountains).

**Essential Questions:**

What are scientific methods?

Why is it important to communicate the results of scientific investigations?

Why do maps of the Earth show distortion?

What five pieces of information should be shown on a map?

How can we use contour lines to show elevation and landforms?

How can we use the relief of an area to determine the contour interval used on a map?

What are the rules of contour lines?

**Earth’s Resources**

**Enduring Understandings:**

Many materials used by people come from rocks and minerals.

Rocks are classified based on how they formed and their mineral composition.

Sedimentary rocks are formed by the ongoing deposition of rocks and other sediments that are cemented together.

Fossils, the remains of organisms preserved in sedimentary rocks, are part of the evidence scientists use to infer changing conditions at the

Earth’s surface through time

**Essential Questions:**

What are the special properties of minerals?

How can one identify minerals?

What characteristics are used to classify rocks?

What happens to a rock as it moves through the rock cycle?

What are alternatives to the use of fossil fuels?

What are some of the advantages and disadvantages of using alternative energy resources?

What is uniformitarianism and catastrophism?

How has the science of geology changed over the past 200 years?

**The Restless Earth**

**Enduring Understandings:**

Human activity can have a positive or a negative impact on? the surface of our Earth.

Human activities can cause or accelerate erosion.

Renewable resources can be replenished within a relatively short time period.

Nonrenewable resources form very slowly, over millions of years. When present supplies are used, there will be no more.

The Earth’s resources can be reduced or used up if humans don’t use conservation strategies.

The sun is the major source of energy for phenomena on the Earth's surface, including winds, ocean currents, and waves.

Through conservation strategies, people can slow down the degradation of the environment and the depletion of non-renewable resources.

The atmosphere and the oceans have a limited capacity to absorb wastes and recycle materials naturally. Cleaning up polluted air, water, or soil or restoring depleted soil, forests, or fishing grounds can be very difficult and costly.

**Essential Questions:**

How are earthquakes detected?

How is the strength of an earthquake measured?

How is the intensity of an earthquake measured?

What are nonexplosive volcanic eruptions?

What are the features of a volcano?

**Reshaping the Land**

**Enduring Understandings:**

Weathering is the process that breaks down rock and other substances at Earth’s surface.

Erosion is the movement of rock particles by water and wind.

Deposition occurs where the agents (forces) of erosion lay down sediment.

Weathering and erosion wear down, and deposition fills in the Earth’s surface.

Although weathered rock is the basic component of soil, the composition and texture of soil and its fertility and resistance to erosion are greatly influenced by plants and other organisms.

Human activities, such as reducing forest cover and intensive farming have changed the

**Essential Questions:**

How does ice, water, wind, gravity, plants, and animals cause mechanical weathering?

How does moving water shape the surface of earth by the process of erosion?

How does water move through the water cycle?

What is a water shed?

What is the difference between alpine glaciers and continental glaciers?

How do glaciers move?

What type of landscape features are formed by alpine glaciers?

**Oceanography**

**Enduring Understandings:**

The majority of the Earth's surface is covered with water.

Most of the water on the Earth is salt water. Only a small amount is fresh water, including water in rivers, many lakes, underground water, and in the form of ice.

The cycling of water in and out of the atmosphere plays an important role in determining climatic patterns.

Water evaporation from the surface of the earth, rises and cools, condenses into rain or snow, and falls again to the surface.

The water, which is a solvent, falling on land collects in rivers and lakes, soil, and porous layers of rock, and much of it flows back into the ocean.

Salts have become concentrated in the sea (compared with freshwater) because the sun's heat causes the evaporation of water, leaving the salts behind.

Underneath the ocean, the Earth has plains, mountains, and? valleys, which are often larger than those on dry land.

Ocean currents can be caused by factors such as wind, salinity, temperature, the Coriolis Effect, and gravitational pull.

Ocean currents flow in predictable patterns around the world.

The moon's gravitational pull and the spinning of the earth cause ocean water to bulge, producing tides.

**Essential Questions:**

What are the two major regions of the ocean?

What are the subdivisions and features of the two major regions of the ocean floor?

What technology is used for studying the ocean floor?

What is the relationship between the Earth, sun, and moon?

What is the relationship between tides and coastal land?

**Weather & Climate**

**Endurance Understandings:**

The difference in heating of the Earth's surface produces the planet's seasons and weather patterns.

The cycling of water in and out of the atmosphere plays an important role in determining climatic patterns.

Heat energy carried by ocean currents has a strong influence on climate around the world.

The sun is the major source of energy for phenomena on the.

Waves transfer energy from one place to another. Waves in oceans and lakes are caused by wind blowing over the surface of the water.

Ocean currents influence the weather in coastal areas. Currents can be caused by wind, differences in salinity, differences in water temperatures caused by uneven heating of the

Earth, the Coriolis Effect which is a consequence of the Earth's rotation, and the gravitational pull of celestial bodies (tidal currents).

**Essential Questions:**

What is the composition of Earth’s atmosphere?

Why does air pressure change with altitude?

What are the layers of the atmosphere?

What types of instruments are used to take weather measurements?

What is the difference between weather and climate?

**Astronomy**

**Enduring Understandings:**

Because the Earth turns daily on an axis that is tilted relative to the plane of the Earth's yearly orbit around the sun, sunlight falls more intensely on different parts of the Earth during the year.

A lunar eclipse occurs when the Moon passes through the Earth’s shadow.

A solar eclipse occurs when the Moon passes between the Earth and the Sun.

**Essential Questions:**

How does color indicate the temperature of a star?

How can a scientist identify a star’s composition?

How is the distance from Earth to stars measured?

What is the relationship between gravity and pressure in a nebula ?

How was the solar system formed?

What is the current theory of the origin of Earth’s moon?

What causes the phases of Earth’s moon?

What are the functions of military, communications, and weather satellites?

How has remote sensing from satellites helped scientist study Earth as a global system?

**Introduction to Earth Science**

**Georgia Performance Standards**

**S6CS1. Students will explore the importance of curiosity, honesty, openness, and skepticism in science and will exhibit these traits in their own efforts to understand how the world works.**

a. Understand the importance of—and keep—honest, clear, and accurate records in science.

b. Understand that hypotheses are valuable if they lead to fruitful investigations, even if the hypotheses turn out not to be completely accurate descriptions.

**S6CS2. 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.

**S6CS3. Students will use computation and estimation skills necessary for analyzing data and following scientific explanations.**

 b. Use metric input units (such as seconds, meters, or grams per milliliter) of scientific calculations to determine the proper unit for expressing the answer.

**S6CS4. Students will use tools and instruments for observing, measuring, and manipulating equipment and materials in scientific activities.**

a. Use appropriate technology to store and retrieve scientific information in topical, alphabetical, numerical, and keyword files, and create simple files.

c. Read analog and digital meters on instruments used to make direct measurements of length, volume, weight, elapsed time, rates, and temperature, and choose appropriate units for reporting various quantities.

**S6CS5. Students will use the ideas of system, model, change, and scale in exploring scientific and technological matters.**

 b. Identify several different models (such as physical replicas, pictures, and analogies) that could be used to represent the same thing, and evaluate their usefulness, taking into account such things as the model’s purpose and complexity.

**S6CS7. Students will question scientific claims and arguments effectively.**

b. Recognize that there may be more than one way to interpret a given set of findings.

**S6CS8. Students will investigate the characteristics of scientific knowledge and how it is achieved.**

a. When similar investigations give different results, the scientific challenge is to judge whether the differences are trivial or significant, which often requires further study. Even with similar results, scientists may wait until an investigation has been repeated many times before accepting the results as meaningful.

b. When new experimental results are inconsistent with an existing, well-established theory, scientists may require further experimentation to decide whether the results are flawed or the theory requires modification.

c. As prevailing theories are challenged by new information, scientific knowledge may change and grow.

**S6CS9. Students will investigate the features of the process of scientific inquiry.**

a. Scientific investigations are conducted for different reasons. They usually involve collecting evidence, reasoning, devising hypotheses, and formulating explanations.

c. Accurate record keeping, data sharing, and replication of results are essential for maintaining an investigator’s credibility with other scientists and society.

d. Scientists use technology and mathematics to enhance the process of scientific inquiry.

**S6E1. Students will explore current scientific views of the universe and how those views evolved.**

a. Relate the Nature of Science to the progression of basic historical scientific models (geocentric, heliocentric) as they describe our solar system, and the Big Bang as it describes the formation of the universe.

**Task: 1**

**Essential Question(s):**

What are scientific methods?

Why is it important to communicate the results of scientific investigations?

**Resources:**

[Solving a Scientific Problem](http://www.glencoe.com/sites/common_assets/science/virtual_labs/ES01/ES01.html)

[Standardized Test Practice](http://glencoe.mcgraw-hill.com/sites/0078778026/student_view0/unit1/chapter1/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. Scientific Methods in Earth Science p.12

8. Engage students in conversation by asking students the following question: How do scientists begin to learn about the natural world? 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 [Solving a Scientific Problem](http://www.glencoe.com/sites/common_assets/science/virtual_labs/ES01/ES01.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 [Solving a Scientific Problem](http://www.glencoe.com/sites/common_assets/science/virtual_labs/ES01/ES01.html) as a whole group activity. Students will then be placed in cooperative learning groups to complete the journal activity.

**Task: 2**

**Essential Question(s):**

Why do maps of the Earth show distortion?

What five pieces of information should be shown on a map?

**Resources:**

[How can locations in the United States be identified by their geographic features virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/ES05/ES05.html)

[U.S. Landforms concept](http://glencoe.mcgraw-hill.com/olcweb/cgi/pluginpop.cgi?it=swf::507::356::/sites/dl/free/0078778441/164155/505_Fig_2.swf::U.S.%20Landforms)

[CRCT practice](http://glencoe.mcgraw-hill.com/sites/0078778441/student_view0/unit2/chapter6/crct_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. Mapping the Earth’s Surface p.42

8. Engage students in conversation by asking students the following question: What are distortions on maps? 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 locations in the United States be identified by their geographic features virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/ES05/ES05.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 locations in the United States be identified by their geographic features virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/ES05/ES05.html) as a whole group activity. Students will then be placed in cooperative learning groups to complete the journal activity.

**Task: 3**

**Essential Question(s):**

How can we use contour lines to show elevation and landforms?

How can we use the relief of an area to determine the contour interval used on a map?

What are the rules of contour lines?

**Resources:**

[Map Projections virtual lesson](http://glencoe.com/sec/science/earthscience/2007/concept_motion/animated_art/MapProjections2_5.avi)

[Types of maps virtual activity](http://glencoe.com/sec/science/earthscience/2007/concept_motion/intr_tables/tables/egeu_ch02_t02_1.swf)

**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.

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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. Topographic Maps p.51

8. Engage students in conversation by asking students the following question: What is an index contour? 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 [Types of maps virtual activity](http://glencoe.com/sec/science/earthscience/2007/concept_motion/intr_tables/tables/egeu_ch02_t02_1.swf)

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)

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**\*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 [Types of maps virtual activity](http://glencoe.com/sec/science/earthscience/2007/concept_motion/intr_tables/tables/egeu_ch02_t02_1.swf) as a whole group activity.

**Earth’s Resources**

Georgia Performance Standards

**S6E5. Students will investigate the scientific view of how the earth’s surface is formed.**

b. Investigate the contribution of minerals to rock composition.

c. Classify rocks by their process of formation.

e. Recognize that lithospheric plates constantly move and cause major geological events on the earth’s surface.

i. Explain the effects of human activity on the erosion of the earth’s surface.

**S6E6. Students will describe various sources of energy and with their uses and conservation.**

a. Explain the role of the sun as the major source of energy and its relationship to wind and water energy.

b. Identify renewable and nonrenewable resources.

**S6CS3. Students will use computation and estimation skills necessary for analyzing data and following scientific explanations.**

b. Use metric input units (such as seconds, meters, or grams per milliliter) of scientific calculations to determine the proper unit for expressing the answer.

**S6CS5. Students will use the ideas of system, model, change, and scale in exploring scientific and technological matters.**

a. Observe and explain how parts are related to other parts in systems such as weather systems, solar systems, and ocean systems including how the output from one part of a system (in the form of material, energy, or information) can become the input to other parts. (For example: El Nino’s effect on weather)

b. Identify several different models (such as physical replicas, pictures, and analogies) that could be used to represent the same thing, and evaluate their usefulness, taking into account such things as the model’s purpose and complexity.

**S6CS6. Students will communicate scientific ideas and activities clearly.**

c. Organize scientific information using appropriate tables, charts, and graphs, and identify relationships they reveal.

**S6CS9. Students will investigate the features of the process of scientific inquiry.**

Students will apply the following to inquiry learning practices:

a. Scientific investigations are conducted for different reasons. They usually involve collecting evidence, reasoning, devising hypotheses, and formulating explanations.

**S6CS4. Students will use tools and instruments for observing, measuring, and manipulating equipment and materials in scientific activities.**

b. Estimate the effect of making a change in one part of a system on the system as a whole.

**S6CS8. Students will investigate the characteristics of scientific knowledge and how it is achieved.**

b. When new experimental results are inconsistent with an existing, well-established theory, scientists may require further experimentation to decide whether the results are flawed or the theory requires modification.

c. As prevailing theories are challenged by new information, scientific knowledge may change and grow.

**S6CS10. 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.

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.

**S6CS1. Students will explore the importance of curiosity, honesty, openness, and skepticism in science and will exhibit these traits in their own efforts to understand how the world works.**

a. Understand the importance of—and keep—honest, clear, and accurate records in science.

**Task: 1**

**Essential Question(s):**

What are the special properties of minerals?

How can one identify minerals?

**Resources:**

[How can minerals be defined by their properties virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/ES03/ES03.html)

[Standardized Test Practice](http://glencoe.mcgraw-hill.com/sites/0078778026/student_view0/unit1/chapter3/standardized_test_practice.html)

[Minerals crossword puzzle](http://glencoe.mcgraw-hill.com/sites/dl/free/0078778026/165477/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)

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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. Identifying Minerals p. 70

8. Engage students in conversation by asking students the following question: How can we determine the identity of a mineral. 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 minerals be defined by their properties virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/ES03/ES03.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 minerals be defined by their properties virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/ES03/ES03.html) as a whole group activity. Students will then be placed in cooperative learning groups to complete the journal activity.

**Task: 2**

**Essential Question(s):**

What characteristics are used to classify rocks?

What happens to a rock as it moves through the rock cycle?

**Resources:**

[How are rocks classified virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/ES04/ES04.html)

[Math across the curriculum](http://glencoe.mcgraw-hill.com/sites/0078778026/student_view0/unit1/chapter4/math_practice.html)

[Standardized Test Practice](http://glencoe.mcgraw-hill.com/sites/0078778026/student_view0/unit1/chapter4/standardized_test_practice.html)

[Rocks virtual lesson](http://glencoe.mcgraw-hill.com/sites/dl/free/0078778026/164213/00044683.html)

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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 Rock Cycle p. 90

8. Engage students in conversation by asking students the following question: What are some ways in which rocks are used by humans? 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

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 rocks classified virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/ES04/ES04.html) as a whole group activity. Students will then be placed in cooperative learning groups to complete the journal activity.

**Task: 3**

**Essential Question(s):**

What are alternatives to the use of fossil fuels?

What are some of the advantages and disadvantages of using alternative energy resources?

**Resources:**

[The advantages of alternative energy resources virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/CT13/CT13.html)

[Standardized Test Practice](http://glencoe.mcgraw-hill.com/sites/0078778026/student_view0/unit1/chapter5/standardized_test_practice.html)

[Drag and Drop Puzzle](http://glencoe.mcgraw-hill.com/olcweb/cgi/pluginpop.cgi?it=dcr::592::370::/sites/dl/free/0078778026/165479/525.dcr::Drag%20and%20Drop%20Puzzle)

**Teacher’s Place:**

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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. Alternative Resources p. 134

8. Engage students in conversation by asking students the following question: What are some of the advantages of producing energy through fusion? 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 [The advantages of alternative energy resources virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/CT13/CT13.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 [The advantages of alternative energy resources virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/CT13/CT13.html) as a whole group activity. Students will then be placed in cooperative learning groups to complete the journal activity.

**Task: 4**

**Essential Question(s):**

What is uniformitarianism and catastrophism?

How has the science of geology changed over the past 200 years?

**Resources:**

[Using fossils and rock to determine when an organism lived virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/ES12/ES12.html)

[Angular Unconformity virtual lesson](http://glencoe.mcgraw-hill.com/olcweb/cgi/pluginpop.cgi?it=swf::465::356::/sites/dl/free/0078778026/164155/512_Fig_13.swf::Angular%20Unconformity)

[Beta Decay virtual lesson](http://glencoe.mcgraw-hill.com/olcweb/cgi/pluginpop.cgi?it=swf::573::300::/sites/dl/free/0078778026/164155/512_Fig_18a.swf::Beta%20Decay)

[Alpha Decay virtual lesson](http://glencoe.mcgraw-hill.com/olcweb/cgi/pluginpop.cgi?it=swf::573::356::/sites/dl/free/0078778026/164155/512_Fig_18b.swf::Alpha%20Decay)

**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.

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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. Earth’s Story and Those Who First Listened P. 152 , Relative Dating p. 156 and Absolute Dating p. 156

8. Engage students in conversation by asking students the following question: How can catastrophe affect life on earth? 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 [**Using fossils and rock to determine when an organism lived virtual lesson**](http://www.glencoe.com/sites/common_assets/science/virtual_labs/ES12/ES12.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 [**Using fossils and rock to determine when an organism lived virtual lesson**](http://www.glencoe.com/sites/common_assets/science/virtual_labs/ES12/ES12.html) as a whole group activity. Students will then be placed in cooperative learning groups to complete the journal activity.

**The Restless Earth**

**Georgia Performance Standards**

**S6E3. Students will recognize the significant role of water in earth processes.**

b. Relate various atmospheric conditions to stages of the water cycle.

c. Describe the composition, location, and subsurface topography of the world’s oceans.

**S6E5. Students will investigate the scientific view of how the earth’s surface is formed.**

a. Compare and contrast the Earth’s crust, mantle, and core including temperature, density, and composition.

c. Classify rocks by their process of formation.

d. Describe processes that change rocks and the surface of the earth.

e. Recognize that lithospheric plates constantly move and cause major geological events on the earth’s surface.

f. Explain the effects of physical processes (plate tectonics, erosion, deposition, volcanic eruption, gravity) on geological features including oceans (composition, currents, and tides).

**S6CS3. Students will use computation and estimation skills necessary for analyzing data and following scientific explanations.**

a. Analyze scientific data by using, interpreting, and comparing numbers in several equivalent forms, such as integers and decimals.

b. Use metric input units (such as seconds, meters, or grams per milliliter) of scientific calculations to determine the proper unit for expressing the answer.

d. Draw conclusions based on analyzed data.

**S6CS6. Students will communicate scientific ideas and activities clearly.**

c. Organize scientific information using appropriate tables, charts, and graphs, and identify relationships they reveal.

**S6CS8. Students will investigate the characteristics of scientific knowledge and how it is achieved.**

c. As prevailing theories are challenged by new information, scientific knowledge may change and grow.

**S6CS4. Students will use tools and instruments for observing, measuring, and manipulating equipment and materials in scientific activities.**

a. Use appropriate technology to store and retrieve scientific information in topical, alphabetical, numerical, and keyword files, and create simple files.

b. Estimate the effect of making a change in one part of a system on the system as a whole.

**S6CS9. Students will investigate the features of the process of scientific inquiry.**

Students will apply the following to inquiry learning practices:

a. Scientific investigations are conducted for different reasons. They usually involve collecting evidence, reasoning, devising hypotheses, and formulating explanations.

d. Scientists use technology and mathematics to enhance the process of scientific inquiry.

**S6CS5. Students will use the ideas of system, model, change, and scale in exploring scientific and technological matters.**

a. Observe and explain how parts are related to other parts in systems such as weather systems, solar systems, and ocean systems including how the output from one part of a system (in the form of material, energy, or information) can become the input to other parts. (For example: El Nino’s effect on weather)

**S6CS7. Students will question scientific claims and arguments effectively.**

 b. Recognize that there may be more than one way to interpret a given set of findings.

**Task: 1**

**Essential Question(s):**

How are earthquakes detected?

**Resources:**

[Where do most earthquake epicenters and volcanoes occur virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/E27/E27.html)

[Earths Plates virtual concept](http://glencoe.mcgraw-hill.com/olcweb/cgi/pluginpop.cgi?it=swf::440::356::/sites/dl/free/0078778026/164155/511_Fig_8.swf::Earths%20Plates)

**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. Earthquake Measurement p.230

8. Engage students in conversation by asking students the following question: What determines an earthquake start time? 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 [Where do most earthquake epicenters and volcanoes occur virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/E27/E27.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 [Where do most earthquake epicenters and volcanoes occur virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/E27/E27.html) as a whole group activity. Students will then be placed in cooperative learning groups to complete the journal activity.

**Task: 2**

**Essential Question(s):**

How is the strength of an earthquake measured?

How is the intensity of an earthquake measured?

**Resources:**

[How do seismographs determine an earthquake virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/ES09/ES09.html)

[Math across the curriculum](http://glencoe.mcgraw-hill.com/sites/0078778026/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. Review the following:

a. Earthquake Measurement p.230

8. Engage students in conversation by asking students the following question: Why is it important for scientist to record the magnitude of an earthquake? 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 do seismographs determine an earthquake virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/ES09/ES09.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 do seismographs determine an earthquake virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/ES09/ES09.html) as a whole group activity. Students will then be placed in cooperative learning groups to complete the journal activity.

**Task: 3**

**Essential Question(s):**

What are nonexplosive volcanic eruptions?

What are the features of a volcano?

**Resources:**

[Magma's composition and a volcano's eruption virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/ES10/ES10.html)

[Concentration game](http://glencoe.mcgraw-hill.com/sites/dl/free/0078778026/165491/index.html)

[Math across the curriculum](http://glencoe.mcgraw-hill.com/sites/0078778026/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. Volcanic Eruptions p.250

8. Engage students in conversation by asking students the following question: What are two differences between explosive and non-explosive eruptions? 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 [Magma's composition and a volcano's eruption virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/ES10/ES10.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 [Magma's composition and a volcano's eruption virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/ES10/ES10.html) as a whole group activity. Students will then be placed in cooperative learning groups to complete the journal activity.

**Reshaping the Land**

Georgia Performance Standards

**S6E5. Students will investigate the scientific view of how the earth’s surface is formed.**

c. Classify rocks by their process of formation.

**S6E3. Students will recognize the significant role of water in earth processes.**

a. Explain that a large portion of the Earth’s surface is water, consisting of oceans, rivers, lakes, underground water, and ice.

b. Relate various atmospheric conditions to stages of the water cycle.

**S6CS3. Students will use computation and estimation skills necessary for analyzing data and following scientific explanations.**

b. Use metric input units (such as seconds, meters, or grams per milliliter) of scientific calculations to determine the proper unit for expressing the answer.

**S6CS4. Students will use tools and instruments for observing, measuring, and manipulating equipment and materials in scientific activities.**

a. Use appropriate technology to store and retrieve scientific information in topical, alphabetical, numerical, and keyword files, and create simple files.

**S6CS6. Students will communicate scientific ideas and activities clearly.**

c. Organize scientific information using appropriate tables, charts, and graphs, and identify relationships they reveal.

**S6CS9. Students will investigate the features of the process of scientific inquiry.**

Students will apply the following to inquiry learning practices:

a. Scientific investigations are conducted for different reasons. They usually involve collecting evidence, reasoning, devising hypotheses, and formulating explanations.

**S6CS5. Students will use the ideas of system, model, change, and scale in exploring scientific and technological matters.**

a. Observe and explain how parts are related to other parts in systems such as weather systems, solar systems, and ocean systems including how the output from one part of a system (in the form of material, energy, or information) can become the input to other parts. (For example: El Nino’s effect on weather)

**S6E5. Students will investigate the scientific view of how the earth’s surface is formed.**

 i. Explain the effects of human activity on the erosion of the earth’s surface.

 **Task: 1**

**Essential Question(s):**

How does ice, water, wind, gravity, plants, and animals cause mechanical weathering?

**Resources:**

[How are materials from the earth broken down virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/E06/E06.html)

[CRCT Practice](http://glencoe.mcgraw-hill.com/sites/0078778441/student_view0/unit2/chapter7/crct_practice.html)

[Weathering crossword tutor](http://glencoe.mcgraw-hill.com/sites/dl/free/0078778441/165483/index.html)

[Math across the curriculum](http://glencoe.mcgraw-hill.com/sites/0078778441/student_view0/unit2/chapter7/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. Weathering p.278

8. Engage students in conversation by asking students the following question: Can you name three things that can cause abrasion? 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 materials from the earth broken down virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/E06/E06.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 materials from the earth broken down virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/E06/E06.html) as a whole group activity. Students will then be placed in cooperative learning groups to complete the journal activity.

**Task: 2**

**Essential Question(s):**

How does moving water shape the surface of earth by the process of erosion?

How does water move through the water cycle?

What is a water shed?

**Resources:**

[Soil erosion by water virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/ES08/ES08.html)

[CRCT practice](http://glencoe.mcgraw-hill.com/sites/0078778441/student_view0/unit2/chapter9/crct_practice.html)

[Math across the curriculum](http://glencoe.mcgraw-hill.com/sites/0078778441/student_view0/unit2/chapter9/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.

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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 Active River p.308

8. Engage students in conversation by asking students the following question: How do you think the Grand Canyon was created? 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 [Soil erosion by water virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/ES08/ES08.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 [Soil erosion by water virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/ES08/ES08.html) as a whole group activity. Students will then be placed in cooperative learning groups to complete the journal activity.

**Task: 3**

**Essential Question(s):**

What is the difference between alpine glaciers and continental glaciers?

How do glaciers move?

What type of landscape features are formed by alpine glaciers?

**Resources:**

[How do glaciers shape the land virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/ES07/ES07.html)

[CRCT practice](http://glencoe.mcgraw-hill.com/sites/0078778441/student_view0/unit2/chapter8/crct_practice.html)

[Crossword tutor](http://glencoe.mcgraw-hill.com/sites/dl/free/0078778441/165484/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.

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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. Erosion and Deposition by ice p.352

8. Engage students in conversation by asking students the following question: Where do you think alpine glaciers form? 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 do glaciers shape the land virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/ES07/ES07.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 do glaciers shape the land virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/ES07/ES07.html)

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

**Oceanography**

Georgia Performance Standards

**S6E2. Students will understand the effects of the relative positions of the earth, moon and sun.**

c. Relate the tilt of the earth to the distribution of sunlight throughout the year and its effect on climate.

**S6E3. Students will recognize the significant role of water in earth processes.**

a. Explain that a large portion of the Earth’s surface is water, consisting of oceans, rivers, lakes, underground water, and ice.

b. Relate various atmospheric conditions to stages of the water cycle.

c. Describe the composition, location, and subsurface topography of the world’s oceans.

d. Explain the causes of waves, currents, and tides.

**S6E4. Students will understand how the distribution of land and oceans affects climate and weather.**

a. Demonstrate that land and water absorb and lose heat at different rates and explain the resulting effects on weather patterns.

**S6E5. Students will investigate the scientific view of how the earth’s surface is formed.**

c. Classify rocks by their process of formation.

e. Recognize that lithospheric plates constantly move and cause major geological events on the earth’s surface.

i. Explain the effects of human activity on the erosion of the earth’s surface.

**S6E6. Students will describe various sources of energy and with their uses and conservation.**

a. Explain the role of the sun as the major source of energy and its relationship to wind and water energy.

b. Identify renewable and nonrenewable resources.

**S6CS5. Students will use the ideas of system, model, change, and scale in exploring scientific and technological matters.**

a. Observe and explain how parts are related to other parts in systems such as weather systems, solar systems, and ocean systems including how the output from one part of a system (in the form of material, energy, or information) can become the input to other parts. (For example: El Nino’s effect on weather)

**S6CS3. Students will use computation and estimation skills necessary for analyzing data and following scientific explanations.**

b. Use metric input units (such as seconds, meters, or grams per milliliter) of scientific calculations to determine the proper unit for expressing the answer.

**S6CS6. Students will communicate scientific ideas and activities clearly.**

b. Understand and describe how writing for scientific purposes is different than writing for literary purposes.

c. Organize scientific information using appropriate tables, charts, and graphs, and identify relationships they reveal.

**S6CS9. Students will investigate the features of the process of scientific inquiry.**

Students will apply the following to inquiry learning practices:

a. Scientific investigations are conducted for different reasons. They usually involve collecting evidence, reasoning, devising hypotheses, and formulating explanations.

d. Scientists use technology and mathematics to enhance the process of scientific inquiry.

**S6CS8. Students will investigate the characteristics of scientific knowledge and how it is achieved.**

c. As prevailing theories are challenged by new information, scientific knowledge may change and grow.

**Task: 1**

**Essential Question(s):**

What are the two major regions of the ocean?

What are the subdivisions and features of the two major regions of the ocean floor?

What technology is used for studying the ocean floor?

**Resources:**

[Characteristics of the ocean floor virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/ES18/ES18.html)

[Ocean Basin Features virtual concept](http://glencoe.mcgraw-hill.com/olcweb/cgi/pluginpop.cgi?it=swf::573::356::/sites/dl/free/0078778441/164155/518_Fig_2.swf::Ocean%20Basin%20Features)

[CRCT practice](http://glencoe.mcgraw-hill.com/sites/0078778441/student_view0/unit5/chapter19/crct_practice.html)

[Math across the curriculum](http://glencoe.mcgraw-hill.com/sites/0078778441/student_view0/unit5/chapter19/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. The Ocean Floor p.382

8. Engage students in conversation by asking students the following question: How might scientist use satellites to make detailed maps of the ocean floor? 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 [Characteristics of the ocean floor virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/ES18/ES18.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 [Characteristics of the ocean floor virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/ES18/ES18.html) as a whole group activity. Students will then be placed in cooperative learning groups to complete the journal activity.

**Task: 2**

**Essential Question(s):**

What is the relationship between the Earth, sun, and moon?

What is the relationship between tides and coastal land?

**Resources:**

[Tides virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/ES17/ES17.html)

[CRCT practice](http://glencoe.mcgraw-hill.com/sites/0078778441/student_view0/unit5/chapter18/crct_practice.html)

[Math across the curriculum](http://glencoe.mcgraw-hill.com/sites/0078778441/student_view0/unit5/chapter18/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. Tides p.432

8. Engage students in conversation by asking students the following question: How might the moon affect Earth’s particles? 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 [Tides virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/ES17/ES17.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 [Tides virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/ES17/ES17.html) as a whole group activity. Students will then be placed in cooperative learning groups to complete the journal activity.

**Weather and Climate**

Georgia Performance Standards

**S6E3. Students will recognize the significant role of water in earth processes.**

b. Relate various atmospheric conditions to stages of the water cycle.

**S6E4. Students will understand how the distribution of land and oceans affects climate and weather.**

a. Demonstrate that land and water absorb and lose heat at different rates and explain the resulting effects on weather patterns.

b. Relate unequal heating of land and water surfaces to form large global wind systems and weather events such as tornados and thunderstorms.

c. Relate how moisture evaporating from the oceans affects the weather patterns and weather events such as hurricanes.

**S6E2. Students will understand the effects of the relative positions of the earth, moon and sun.**

c. Relate the tilt of the earth to the distribution of sunlight throughout the year and its effect on climate.

**S6CS3. Students will use computation and estimation skills necessary for analyzing data and following scientific explanations.**

b. Use metric input units (such as seconds, meters, or grams per milliliter) of scientific calculations to determine the proper unit for expressing the answer.

**S6CS5. Students will use the ideas of system, model, change, and scale in exploring scientific and technological matters.**

a. Observe and explain how parts are related to other parts in systems such as weather systems, solar systems, and ocean systems including how the output from one part of a system (in the form of material, energy, or information) can become the input to other parts. (For example: El Nino’s effect on weather)

**S6CS9. Students will investigate the features of the process of scientific inquiry.**

Students will apply the following to inquiry learning practices:

a. Scientific investigations are conducted for different reasons. They usually involve collecting evidence, reasoning, devising hypotheses, and formulating explanations.

d. Scientists use technology and mathematics to enhance the process of scientific inquiry.

**S6CS4. Students will use tools and instruments for observing, measuring, and manipulating equipment and materials in scientific activities.**

c. Read analog and digital meters on instruments used to make direct measurements of length, volume, weight, elapsed time, rates, and temperature, and choose appropriate units for reporting various quantities.

**S6E1. Students will explore current scientific views of the universe and how those views evolved.**

f. Describe the characteristics of comets, asteroids, and meteors.

**S6E5. Students will investigate the scientific view of how the earth’s surface is formed.**

d. Describe processes that change rocks and the surface of the earth.

**Task: 1**

**Essential Question(s):**

What is the composition of Earth’s atmosphere?

Why does air pressure change with altitude?

What are the layers of the atmosphere?

**Resources:**

[The structure of Earth's atmosphere virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/ES14/ES14.html)

[CRCT practice](http://glencoe.mcgraw-hill.com/sites/0078778441/student_view0/unit5/chapter15/crct_practice.html)

[The Water Cycle virtual concept](http://glencoe.mcgraw-hill.com/olcweb/cgi/pluginpop.cgi?it=swf::573::356::/sites/dl/free/0078778441/164155/514_Fig_13.swf::The%20Water%20Cycle)

**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. Characteristics of the Atmosphere p. 448 and The water cycle p.482

8. Engage students in conversation by asking students the following question: What are the three physical states of water in the atmosphere? 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 [The structure of Earth's atmosphere virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/ES14/ES14.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 [The structure of Earth's atmosphere virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/ES14/ES14.html)

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

**Task: 2**

**Essential Question(s):**

What types of instruments are used to take weather measurements?

**Resources:**

[How do meteorologist predict the weather virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/ES15/ES15.html)

[Fronts virtual concept](http://glencoe.mcgraw-hill.com/olcweb/cgi/pluginpop.cgi?it=swf::430::356::/sites/dl/free/0078778441/164155/515_Fig_11.swf::Fronts)

[CRCT practice](http://glencoe.mcgraw-hill.com/sites/0078778441/student_view0/unit5/chapter16/crct_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. Forecasting the Weather p.504

8. Engage students in conversation by asking students the following question: How do meteorologists gather data on atmosphere conditions above Earth’s surface? 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 do meteorologist predict the weather virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/ES15/ES15.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 do meteorologist predict the weather virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/ES15/ES15.html) as a whole group activity. Students will then be placed in cooperative learning groups to complete the journal activity.

**Task: 3**

**Essential Question(s):**

What is the difference between weather and climate?

**Resources:**

[How can locations be identified by their climate and topography virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/ES16/ES16.html)

[Climate Types concept](http://glencoe.mcgraw-hill.com/olcweb/cgi/pluginpop.cgi?it=swf::573::356::/sites/dl/free/0078778441/164155/516_Fig_5.swf::Climate%20Types)

[CRCT practice](http://glencoe.mcgraw-hill.com/sites/0078778441/student_view0/unit5/chapter17/crct_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. Forecasting the Weather p.504

Introduce the following:

a. What is climate p.518

8. Engage students in conversation by asking students the following question: What is climate? and What is weather? 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 locations be identified by their climate and topography virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/ES16/ES16.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 locations be identified by their climate and topography virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/ES16/ES16.html) as a whole group activity. Students will then be placed in cooperative learning groups to complete the journal activity.

**Astronomy**

**Georgia Performance Standards**

**S6E1. Students will explore current scientific views of the universe and how those views evolved.**

a. Relate the Nature of Science to the progression of basic historical scientific models (geocentric, heliocentric) as they describe our solar system, and the Big Bang as it describes the formation of the universe.

b. Describe the position of the solar system in the Milky Way galaxy and the universe.

c. Compare and contrast the planets in terms of

Size relative to the earth

Surface and atmospheric features

Relative distance from the sun

Ability to support life

d. Explain the motion of objects in the day/night sky in terms of relative position.

e. Explain that gravity is the force that governs the motion in the solar system.

f. Describe the characteristics of comets, asteroids, and meteors.

**S6E2. Students will understand the effects of the relative positions of the earth, moon and sun.**

n, and sun during solar and lunar eclipses.

**S6E3. Students will recognize the significant role of water in earth processes.**

a. Explain that a large portion of the Earth’s surface is water, consisting of oceans, rivers, lakes, underground water, and ice.

**S6E5. Students will investigate the scientific view of how the earth’s surface is formed.**

a. Compare and contrast the Earth’s crust, mantle, and core including temperature, density, and composition.

d. Describe processes that change rocks and the surface of the earth.

e. Recognize that lithospheric plates constantly move and cause major geological events on the earth’s surface.

**S6CS8. Students will investigate the characteristics of scientific knowledge and how it is achieved.**

c. As prevailing theories are challenged by new information, scientific knowledge may change and grow.

**S6CS9. Students will investigate the features of the process of scientific inquiry.**

Students will apply the following to inquiry learning practices:

a. Scientific investigations are conducted for different reasons. They usually involve collecting evidence, reasoning, devising hypotheses, and formulating explanations.

d. Scientists use technology and mathematics to enhance the process of scientific inquiry.

**S6CS3. Students will use computation and estimation skills necessary for analyzing data and following scientific explanations.**

a. Analyze scientific data by using, interpreting, and comparing numbers in several equivalent forms, such as integers and decimals.

b. Use metric input units (such as seconds, meters, or grams per milliliter) of scientific calculations to determine the proper unit for expressing the answer.

**S6CS4. Students will use tools and instruments for observing, measuring, and manipulating equipment and materials in scientific activities.**

**S6CS5. Students will use the ideas of system, model, change, and scale in exploring scientific and technological matters.**

a. Observe and explain how parts are related to other parts in systems such as weather systems, solar systems, and ocean systems including how the output from one part of a system (in the form of material, energy, or information) can become the input to other parts. (For example: El Nino’s effect on weather)

**S6CS7. Students will question scientific claims and arguments effectively.**

b. Recognize that there may be more than one way to interpret a given set of findings.

**Task: 1**

**Essential Question(s):**

How does color indicate the temperature of a star?

How can a scientist identify a star’s composition?

How is the distance from Earth to stars measured?

**Resources:**

[How does the chemical composition of stars determine their classification virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/ES24/ES24.html)

[Fusion of Hydrogen to Helium concept](http://glencoe.mcgraw-hill.com/olcweb/cgi/pluginpop.cgi?it=swf::573::225::/sites/dl/free/0078778441/164155/524_Fig_12.swf::Fusion%20of%20Hydrogen%20to%20Helium)

[CRCT practice](http://glencoe.mcgraw-hill.com/sites/0078778441/student_view0/unit7/chapter25/crct_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. Stars p.582

8. Engage students in conversation by asking students the following question: Which star is hotter, Betelgeuse or Rigel? 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 the chemical composition of stars determine their classification virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/ES24/ES24.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 the chemical composition of stars determine their classification virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/ES24/ES24.html) as a whole group activity. Students will then be placed in cooperative learning groups to complete the journal activity.

**Task: 2**

**Essential Question(s):**

What is the relationship between gravity and pressure in a nebula ?

How was the solar system formed?

**Resources:**

[What are the dimensions of the solar system virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/E28/E28.html)

[Astronomical Units concept](http://glencoe.mcgraw-hill.com/olcweb/cgi/pluginpop.cgi?it=swf::573::254::/sites/dl/free/0078778441/164155/523_Fig_1.swf::Astronomical%20Units)

[CRCT practice](http://glencoe.mcgraw-hill.com/sites/0078778441/student_view0/unit7/chapter24/crct_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. A Solar System is Born p.614

8. Engage students in conversation by asking students the following question: What is the solar nebula? 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 dimensions of the solar system virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/E28/E28.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 dimensions of the solar system virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/E28/E28.html) as a whole group activity. Students will then be placed in cooperative learning groups to complete the journal activity.

**Task: 3**

**Essential Question(s):**

What is the current theory of the origin of Earth’s moon?

What causes the phases of Earth’s moon?

**Resources:**

[How do Earth and the moon interact to cause moon's phases virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/ES22/ES22.html)

[Moon Exploration concept](http://glencoe.mcgraw-hill.com/olcweb/cgi/pluginpop.cgi?it=swf::573::356::/sites/dl/free/0078778441/164155/522_Fig_15.swf::Moon%20Exploration)

[CRCT practice](http://glencoe.mcgraw-hill.com/sites/0078778441/student_view0/unit7/chapter23/crct_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. Moons p.660

8. Engage students in conversation by asking students the following question: What happens during a solar eclipse? 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 do Earth and the moon interact to cause moon's phases virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/ES22/ES22.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 do Earth and the moon interact to cause moon's phases virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/ES22/ES22.html) as a whole group activity. Students will then be placed in cooperative learning groups to complete the journal activity.

**Task: 4**

**Essential Question(s):**

What are the functions of military, communications, and weather satellites?

How has remote sensing from satellites helped scientist study Earth as a global system?

**Resources:**

[How does an artificial satellite stay in orbit virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/ES21/ES21.html)

[CRCT practice](http://glencoe.mcgraw-hill.com/sites/0078778441/student_view0/unit7/chapter22/crct_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. Artificial Satellites p.688

8. Engage students in conversation by asking students the following question: What is the difference between GEO and LEO? 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 an artificial satellite stay in orbit virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/ES21/ES21.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 an artificial satellite stay in orbit virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/ES21/ES21.html) as a whole group activity. Students will then be placed in cooperative learning groups to complete the journal activity.

**Task Websites**

<http://thevillage411.weebly.com/units-of-instruction2.html>

Unit 1

[Solving a Scientific Problem](http://www.glencoe.com/sites/common_assets/science/virtual_labs/ES01/ES01.html)

[Standardized Test Practice](http://glencoe.mcgraw-hill.com/sites/0078778026/student_view0/unit1/chapter1/standardized_test_practice.html)

[How can locations in the United States be identified by their geographic features virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/ES05/ES05.html)

[U.S. Landforms concept](http://glencoe.mcgraw-hill.com/olcweb/cgi/pluginpop.cgi?it=swf::507::356::/sites/dl/free/0078778441/164155/505_Fig_2.swf::U.S.%20Landforms)

[CRCT practice](http://glencoe.mcgraw-hill.com/sites/0078778441/student_view0/unit2/chapter6/crct_practice.html)

[Map Projections virtual lesson](http://glencoe.com/sec/science/earthscience/2007/concept_motion/animated_art/MapProjections2_5.avi)

[Types of maps virtual activity](http://glencoe.com/sec/science/earthscience/2007/concept_motion/intr_tables/tables/egeu_ch02_t02_1.swf)

Unit 2

[How can minerals be defined by their properties virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/ES03/ES03.html)

[Standardized Test Practice](http://glencoe.mcgraw-hill.com/sites/0078778026/student_view0/unit1/chapter3/standardized_test_practice.html)

[Minerals crossword puzzle](http://glencoe.mcgraw-hill.com/sites/dl/free/0078778026/165477/index.html)

[How are rocks classified virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/ES04/ES04.html)

[Math across the curriculum](http://glencoe.mcgraw-hill.com/sites/0078778026/student_view0/unit1/chapter4/math_practice.html)

[Standardized Test Practice](http://glencoe.mcgraw-hill.com/sites/0078778026/student_view0/unit1/chapter4/standardized_test_practice.html)

[Rocks virtual lesson](http://glencoe.mcgraw-hill.com/sites/dl/free/0078778026/164213/00044683.html)

[The advantages of alternative energy resources virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/CT13/CT13.html)

[Standardized Test Practice](http://glencoe.mcgraw-hill.com/sites/0078778026/student_view0/unit1/chapter5/standardized_test_practice.html)

[Drag and Drop Puzzle](http://glencoe.mcgraw-hill.com/olcweb/cgi/pluginpop.cgi?it=dcr::592::370::/sites/dl/free/0078778026/165479/525.dcr::Drag%20and%20Drop%20Puzzle)

[Using fossils and rock to determine when an organism lived virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/ES12/ES12.html)

[Angular Unconformity virtual lesson](http://glencoe.mcgraw-hill.com/olcweb/cgi/pluginpop.cgi?it=swf::465::356::/sites/dl/free/0078778026/164155/512_Fig_13.swf::Angular%20Unconformity)

[Beta Decay virtual lesson](http://glencoe.mcgraw-hill.com/olcweb/cgi/pluginpop.cgi?it=swf::573::300::/sites/dl/free/0078778026/164155/512_Fig_18a.swf::Beta%20Decay)

[Alpha Decay virtual lesson](http://glencoe.mcgraw-hill.com/olcweb/cgi/pluginpop.cgi?it=swf::573::356::/sites/dl/free/0078778026/164155/512_Fig_18b.swf::Alpha%20Decay)

Unit 3

[Where do most earthquake epicenters and volcanoes occur virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/E27/E27.html)

[Earths Plates virtual concept](http://glencoe.mcgraw-hill.com/olcweb/cgi/pluginpop.cgi?it=swf::440::356::/sites/dl/free/0078778026/164155/511_Fig_8.swf::Earths%20Plates)

[How do seismographs determine an earthquake virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/ES09/ES09.html)

[Math across the curriculum](http://glencoe.mcgraw-hill.com/sites/0078778026/student_view0/unit3/chapter11/math_practice.html)

[Magma's composition and a volcano's eruption virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/ES10/ES10.html)

[Concentration game](http://glencoe.mcgraw-hill.com/sites/dl/free/0078778026/165491/index.html)

[Math across the curriculum](http://glencoe.mcgraw-hill.com/sites/0078778026/student_view0/unit3/chapter12/math_practice.html)

Unit4

[How are materials from the earth broken down virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/E06/E06.html)

[CRCT Practice](http://glencoe.mcgraw-hill.com/sites/0078778441/student_view0/unit2/chapter7/crct_practice.html)

[Weathering crossword tutor](http://glencoe.mcgraw-hill.com/sites/dl/free/0078778441/165483/index.html)

[Math across the curriculum](http://glencoe.mcgraw-hill.com/sites/0078778441/student_view0/unit2/chapter7/math_practice.html)

[Soil erosion by water virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/ES08/ES08.html)

[CRCT practice](http://glencoe.mcgraw-hill.com/sites/0078778441/student_view0/unit2/chapter9/crct_practice.html)

[Math across the curriculum](http://glencoe.mcgraw-hill.com/sites/0078778441/student_view0/unit2/chapter9/math_practice.html)

[How do glaciers shape the land virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/ES07/ES07.html)

[CRCT practice](http://glencoe.mcgraw-hill.com/sites/0078778441/student_view0/unit2/chapter8/crct_practice.html)

[Crossword tutor](http://glencoe.mcgraw-hill.com/sites/dl/free/0078778441/165484/index.html)

Unit 5

[Characteristics of the ocean floor virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/ES18/ES18.html)

[Ocean Basin Features virtual concept](http://glencoe.mcgraw-hill.com/olcweb/cgi/pluginpop.cgi?it=swf::573::356::/sites/dl/free/0078778441/164155/518_Fig_2.swf::Ocean%20Basin%20Features)

[CRCT practice](http://glencoe.mcgraw-hill.com/sites/0078778441/student_view0/unit5/chapter19/crct_practice.html)

[Math across the curriculum](http://glencoe.mcgraw-hill.com/sites/0078778441/student_view0/unit5/chapter19/math_practice.html)

[Tides virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/ES17/ES17.html)

[CRCT practice](http://glencoe.mcgraw-hill.com/sites/0078778441/student_view0/unit5/chapter18/crct_practice.html)

[Math across the curriculum](http://glencoe.mcgraw-hill.com/sites/0078778441/student_view0/unit5/chapter18/math_practice.html)

Unit 6

[The structure of Earth's atmosphere virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/ES14/ES14.html)

[CRCT practice](http://glencoe.mcgraw-hill.com/sites/0078778441/student_view0/unit5/chapter15/crct_practice.html)

[The Water Cycle virtual concept](http://glencoe.mcgraw-hill.com/olcweb/cgi/pluginpop.cgi?it=swf::573::356::/sites/dl/free/0078778441/164155/514_Fig_13.swf::The%20Water%20Cycle)

[How do meteorologist predict the weather virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/ES15/ES15.html)

[Fronts virtual concept](http://glencoe.mcgraw-hill.com/olcweb/cgi/pluginpop.cgi?it=swf::430::356::/sites/dl/free/0078778441/164155/515_Fig_11.swf::Fronts)

[CRCT practice](http://glencoe.mcgraw-hill.com/sites/0078778441/student_view0/unit5/chapter16/crct_practice.html)

[How can locations be identified by their climate and topography virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/ES16/ES16.html)

[Climate Types concept](http://glencoe.mcgraw-hill.com/olcweb/cgi/pluginpop.cgi?it=swf::573::356::/sites/dl/free/0078778441/164155/516_Fig_5.swf::Climate%20Types)

[CRCT practice](http://glencoe.mcgraw-hill.com/sites/0078778441/student_view0/unit5/chapter17/crct_practice.html)

Unit 7

[How does the chemical composition of stars determine their classification virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/ES24/ES24.html)

[Fusion of Hydrogen to Helium concept](http://glencoe.mcgraw-hill.com/olcweb/cgi/pluginpop.cgi?it=swf::573::225::/sites/dl/free/0078778441/164155/524_Fig_12.swf::Fusion%20of%20Hydrogen%20to%20Helium)

[CRCT practice](http://glencoe.mcgraw-hill.com/sites/0078778441/student_view0/unit7/chapter25/crct_practice.html)

[What are the dimensions of the solar system virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/E28/E28.html)

[Astronomical Units concept](http://glencoe.mcgraw-hill.com/olcweb/cgi/pluginpop.cgi?it=swf::573::254::/sites/dl/free/0078778441/164155/523_Fig_1.swf::Astronomical%20Units)

[CRCT practice](http://glencoe.mcgraw-hill.com/sites/0078778441/student_view0/unit7/chapter24/crct_practice.html)

[How do Earth and the moon interact to cause moon's phases virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/ES22/ES22.html)

[Moon Exploration concept](http://glencoe.mcgraw-hill.com/olcweb/cgi/pluginpop.cgi?it=swf::573::356::/sites/dl/free/0078778441/164155/522_Fig_15.swf::Moon%20Exploration)

[CRCT practice](http://glencoe.mcgraw-hill.com/sites/0078778441/student_view0/unit7/chapter23/crct_practice.html)

[How does an artificial satellite stay in orbit virtual lesson](http://www.glencoe.com/sites/common_assets/science/virtual_labs/ES21/ES21.html)

[CRCT practice](http://glencoe.mcgraw-hill.com/sites/0078778441/student_view0/unit7/chapter22/crct_practice.html)