



This course supports the assessments for Middle School Science: Content Knowledge. Students should take the Middle School Praxis (5440) when possible, but can take the General Science Praxis (5435) if necessary. This course prepares students for both exams. The course covers 24 competencies and represents 9 competency units.

Introduction

Overview

This course covers the following topics:

- scientific methodology, techniques, and history
- basic principles
- physical sciences
- life science
- earth/space sciences
- science, technology, and society

Watch the following video for an introduction to this course:

Note: To download this video, right-click the following link and choose "Save as...": [download video](#).

Competencies

This course provides guidance to help you demonstrate the following 24 competencies:

- **Competency 204.2.1: Molecular and Cellular Biology**
The graduate has a broad understanding of the important concepts in molecular & cellular biology.
- **Competency 204.2.2: Biology of Organisms**
The graduate has a broad understanding of the important concepts related to the biology of organisms.
- **Competency 204.2.3: Ecology**
The graduate has a broad understanding of important concepts of ecology.
- **Competency 204.2.4 : Evolution**
The graduate has a broad understanding of evolution and the history of life on Earth.
- **Competency 216.1.2: Elements and Compounds**
The graduate analyzes the structure of atoms and compounds and applies systems for naming compounds.
- **Competency 216.1.3: Matter and Energy**
The graduate applies the principles of measurement and the concepts of matter and energy to solve problems.
- **Competency 216.1.5: Stoichiometry**
The graduate determines quantities of materials consumed and produced in chemical reactions using moles and stoichiometry.



- **Competency 216.1.7: Modern Atomic Theory**
The graduate applies the modern atomic theory to explain the structure of atoms and periodic trends.
- **Competency 216.1.8: The Chemical Bond**
The graduate predicts the nature of chemical bonds formed between atoms from various elemental groups.
- **Competency 204.4.1: Energy**
The graduate has a broad understanding of energy, including mechanics, heat, and electricity and magnetism.
- **Competency 204.4.2: Nuclear Physics & Wave Motion**
The graduate has a broad understanding of wave motion and atomic nuclear physics.
- **Competency 204.5.1: Astronomy**
The graduate has a broad understanding of the basic concepts of astronomy.
- **Competency 204.5.2: Geology**
The graduate has a broad understanding of the principles of geology.
- **Competency 204.5.3: Meteorology**
The graduate has a broad understanding of the concepts of meteorology.
- **Competency 204.5.4: Oceanography**
The graduate has a broad understanding of the basic concepts of oceanography.
- **Competency 663.1.1: Common Themes in Science**
The graduate analyzes the relationships among themes that appear across multiple scientific ideas.
- **Competency 663.1.2: Nature of Science**
The graduate analyzes the nature of science, including how science distinguishes itself from other ways of knowing.
- **Competency 663.1.3: Historical Development of Science**
The graduate analyzes the historical development of science, including how scientific knowledge evolves.
- **Competency 663.1.4: Interrelationship of Science, Technology and Society**
The graduate analyzes the various ways in which science, technology, and society are interrelated.
- **Competency 663.1.5: Analyzing Issues and Making Decisions**
The graduate analyzes socially relevant scientific issues to make informed decisions based on data and context.
- **Competency 663.1.6: Investigations in Science**
The graduate analyzes the principles, processes, and assumptions of investigations in science to engage students in the nature of inquiry.
- **Competency 663.1.7: Improving Investigations and Communication**
The graduate uses technology tools and mathematics to improve investigations and the communication of results.
- **Competency 663.1.8: Hypotheses and Scientific Investigations**
The graduate formulates testable hypotheses for scientific investigations.
- **Competency 663.1.9: Carrying Out Investigations in Science**
The graduate conducts investigations in science to solve open-ended problems using appropriate scientific methods.



Course Instructor Assistance

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Cohorts and Webinars

Middle School Science/General Science Praxis Cohort sessions are held most Tuesdays at 7:00 pm Mountain Time. Each webinar will address a specific topic and will be open following this discussion to general questions and answers. View the current cohort and webinar schedule for [Middle School Science](#) or [Earth and Space Sciences](#).

Teaching Dispositions Statement

Please review the [Statement of Teaching Dispositions](#).

Preparing for Success

The information in this section is provided to detail the resources available for you to use as you complete this course.

Learning Resources

The learning resources listed in this section are required to complete the activities in this course. For many resources, WGU has provided automatic access through the course. However, you may need to manually enroll in or independently acquire other resources. Read the full instructions provided to ensure that you have access to all of your resources in a timely manner.

The course assessment is the Middle School Science (5440) Praxis Subject Assessment or the General Science (5435) Praxiz Subject Assessment. These are third-party exams offered by Educational Testing Services (ETS). You will need to identify a testing center and schedule a date to take this exam. Please discuss the information found at the following web page with your program mentor to ensure that you have plenty of time to review all relevant content before taking the exam.

- [Exam Registration](#)

Getting Started: *Important!*

Download the following FREE Study Companions from the [ETS website](#):

- [Study Companion \(Print\) General Science: Content Knowledge](#)
- [Study Companion \(Print\) Middle School Science: Content Knowledge](#)

Within these resources are practice questions for the each Praxis Subject Assessment. After working through this course, you will use these practice questions as the preassessment for the



actual exam.

Register for your preferred Praxis Subject Assessment dates at least 4 weeks in advance of the test. [See exam dates here.](#)

This online exam must be taken at an approved testing center, not from home. It is OK to take the Praxis Subject Assessment in a neighboring state. Please identify the nearest testing center using the [Test Center Locator](#).

For disability accommodations, please see [Accommodations for Test Takers with Disabilities of Health Related Needs](#). Note that requests for accommodation as well as registration must be made in writing through U.S. Mail (not online). It may take 6–12 weeks for accommodations to be made and your range of available testing dates may be restricted.

If you need additional time because English is not your native language, please see [Test Takers Needing Other Accommodations](#).

Start planning *now!*

Enroll in Learning Resources

Take a moment to enroll in the learning resources listed in this section. To enroll, navigate to the Learning Resources tab, click the Sections button, and then click the Enroll Now button for each resource. Once your mentor approves your enrollment in the resource, you will receive an e-mail with further access instructions. Contact your mentor if you have questions.

Chemistry - Section 1 of OWL

This web-based resource provides access to Thinkwell videos, Mastery questions, End of Chapter (EOC) questions, and the following e-text:

- Zumdahl, S., & Zumdahl, S. (2010). *Chemistry* (9th ed.). Belmont, CA: Brooks/Cole. ISBN: 1-133-61109-5

Please follow these registration steps carefully in order to access your resource.

- Go to <http://login.cengagebrain.com/course/E-24YE3Q87N3UZ8>.
- Under New Students enter your WGU e-mail address using the @my.wgu.edu extension and click Create a New Account.
- Enter the required information to create an account: First Name, Last Name, Password creation, Security Question and Answer, and check the box to agree to the terms of the site.
- You will be logged in under your new account. Click the Open button next to your Chemistry 9th Edition resource listing.
- Please make note of the login credentials you created for this site.
- We recommend adding <https://login.cengagebrain.com/cb/login.htm> to your browser Favorites so you can easily login to the resource in the future.



After logging in, choose "Assignment List" from the left-hand column. Complete the activities in the "Introduction to OWL" folder to be sure your computer is compatible with this resource. The following 4.5-minute recording will help you navigate OWL:

- [OWL Introduction](#)

1. Go to [Chemistry: Content Knowledge](#)
2. Under *New Students* enter your WGU e-mail address using the **@my.wgu.edu** extension and click *Create a New Account*.
3. Enter the required information to create an account: First Name, last Name, Password creation, Security Question and Answer, and check the box to agree to the terms of the site.
4. You will be logged in under your new account. Click the *Open* button next to your Chemistry 9th Edition resource listing.
5. **Please make note of the login credentials you created** for this site.
6. We recommend adding the Cengage [Login Page](#) to your browser Favorites so you can easily login to the resource in the future.

For technical support with this resource, you can [contact Cengage](#). For content and resource navigation questions, please contact your Course Instructor.

Good luck with your studies!

Automatically Enrolled Learning Resources

You can access the learning resources listed in this section by clicking on the links provided throughout the course. You may be prompted to log in to the WGU student portal to access the resources.

VitalSource E-Texts

The following textbooks are available to you as an e-text within this course. You will be directly linked to the specific readings required within the activities that follow. *VitalSource texts are available to you as part of your program tuition and fees, but you may purchase a hard copy at your own expense through a retailer of your choice. If you choose to do so, please use the ISBN listed to ensure that you receive the correct edition.*

- Campbell, N., & Reece, J. (2011). *Biology* (9th ed.). San Francisco, CA: Benjamin Cummings. ISBN-13: 978-0-321-69707-3.
- Tarbuck, E., Lutgens, F., & Tasa, D. (2014). *Earth science* (14th ed.). Hoboken, NJ: Prentice Hall. ISBN-13: 978-0321928092.
- Hewitt, P.G. (2008). *Conceptual physics* (11th ed.). San Francisco, CA: Addison Wesley. ISBN-13: 9780321596369



Note: These e-texts are available to you as part of your program tuition and fees, but you may purchase a hard copy at your own expense through VitalSource or a retailer of your choice. If you choose to do so, please use the ISBN listed to ensure that you receive the correct edition. The following sites provide instruction on how to create a VitalSource account, use features such as downloading your e-texts for offline use, and purchase a print-on-demand option, if available.

- [VitalSource Navigational Video](#)
- [Print-on-Demand Option](#)

The **ETS Practice Exam** is a full-length practice test that allows you to work through a set of test questions to simulate what you will experience on the actual day of the PRAXIS exam. After a completed attempt, you can view your score and review explanations for the correct answers. You will have unlimited attempts regardless of any notice to the contrary on the ETS website. This practice test includes one set of test questions. Retaking it will not provide different sets of questions or change the order in which they are delivered. If you have any questions, please contact your Course Instructor.

Homework Assignments

Instructional Text

Pacing Guide

The pacing guide suggests a weekly structure to pace your completion of learning activities. It is provided as a suggestion and does not represent a mandatory schedule. Follow the pacing guide carefully to complete the course in the suggested timeframe.

Week 1

- Preparing for Success
 - The Chemistry section of OWL will be used in this course. Review the OWL Introduction video.
 - The following textbooks are available as e-texts within this course.
 - Campbell, N., & Reece, J. (2011). *Biology* (9th ed.). San Francisco, CA: Benjamin Cummings. ISBN-13: 978- 0-321-69707-3.
 - Tarbuck, E., Lutgens, F., & Tasa, D. (2014). *Earth science* (14th ed.). Hoboken, NJ: Prentice Hall. ISBN- 13:978-0321928092.
 - Hewitt, P. G. (2008). *Conceptual physics* (11th ed.). San Francisco, CA: Addison Wesley. ISBN-13: 9780321596369.
 - Follow instructions in the study plan to access the Praxis Study Guide.
- Methodology and Philosophy
 - Read Middle School Science and General Science: Content Knowledge.
 - Read Methods of scientific inquiry.
 - Read through How science works: The flowchart.
- Scientific Tools
 - Read Processes involved in scientific data collection and manipulation and Interpret and draw conclusions from data presented in tables, graphs, and charts.



- Explore the Visionlearning Library.
- Safety
 - Read Procedures for safe and correct preparation, storage, use, and disposal of laboratory materials, Safety and emergency procedures in the laboratory, and How to use standard equipment in the laboratory.
 - Review Laboratory Safety
- Scientific Ideas Changing Over Time
 - Read Historical developments of science and the contributions of major historical figures.

Week 2

- Atomic Models
 - Take the chapter 2 end of chapter exam within the OWL resource.
 - Review chapter 2.
- Stoichiometry
 - Take the chapter 3 end of chapter exam within the OWL resource.
 - Review chapter 3.
- Energy
 - Take the chapter 6 end of chapter exam within the OWL resource.
 - Review chapter 6.
- The Structure of Atoms
 - Take the chapter 7 end of chapter exam within the OWL resource.
 - Review chapter 7.
- Bonding of Atoms
 - Take the chapter 8 end of chapter exam within the OWL resource.
 - Review chapter 8.

Week 3

- Intermolecular Interactions
 - Take the chapter 10 end of chapter exam within the OWL resource.
 - Review chapter 10.
- Solutions and Solubility
 - Take the chapter 11 end of chapter exam within the OWL resource.
 - Review chapter 11.
- Acid-Base Chemistry and Equilibrium
 - Take the chapter 14 end of chapter exam within the OWL resource.
 - Review chapter 14.

Weeks 4-5

- Mechanics
 - Take the chapter 2 exam.
 - Review chapter 2.
 - Take the chapter 3 exam.



- Review chapter 3.
- Take the chapter 4 exam.
- Review chapter 4.
- Take the chapter 5 exam.
- Review chapter 5.
- Take the chapter 6 exam.
- Review chapter 6.
- Take the chapter 7 exam.
- Review chapter 7.
- Take the chapter 8 exam.
- Review chapter 8.
- Take the chapter 9 exam.
- Review chapter 9.
- Take the chapter 10 exam.
- Review chapter 10.
- Properties of Matter
 - Take the chapter 13 exam.
 - Review chapter 13.

Week 6

- Waves
 - Take the chapter 19 exam.
 - Review chapter 19.
 - Take the chapter 20 exam.
 - Review chapter 20.
- Electromagnetism
 - Take the chapter 22 exam.
 - Review chapter 22.
 - Take the chapter 23 exam.
 - Review chapter 23.
 - Take the chapter 24 exam.
 - Review chapter 24

Weeks 7-9

- Applications of Light
 - Take the chapter 25 exam.
 - Take the chapter 26 exam.
 - Review chapter 25.
 - Review chapter 26.
 - Take the chapter 28 exam.
 - Review chapter 28.
 - Take the chapter 29 exam.
 - Review chapter 29.
- Life Sciences



- Review chapter 1.
- Take the chapter 1 self-quiz.
- Review chapter 3.
- Take the chapter 3 self-quiz.
- Review chapter 6.
- Take the chapter 6 self-quiz.
- Review chapter 7.
- Take the chapter 7 self-quiz.
- Review chapter 8.
- Take the chapter 8 self-quiz.
- Review chapter 9.
- Take the chapter 9 self-quiz.
- Review chapter 11.
- Take the chapter 11 self-quiz.
- Review chapter 12
- Take the chapter 12 self-quiz.
- Review chapter 13
- Take the chapter 13 self-quiz.
- Review chapter 16
- Take the chapter 16 self-quiz.
- Review chapter 17
- Take the chapter 17 self-quiz.
- Review chapter 25
- Take the chapter 25 self-quiz.
- Review chapter 28
- Take the chapter 28 self-quiz.
- Review chapter 40
- Take the chapter 40 self-quiz.
- Review chapter 41
- Take the chapter 41 self-quiz.
- Review chapter 43
- Take the chapter 43 self-quiz.
- Minerals, Rocks, and Rock Cycle
 - Read chapter 2 of Earth Science
 - Review the "Minerals" presentation.
 - Review the "Most Rocks Are Aggregates of Minerals" presentation
 - Read "Properties of Minerals" and "Mineral Groups" in chapter 2 of Earth Science
 - Review figure 2.24 and table 2.1 in the "Hardness Scales" SmartFigure.
 - Review the "Atoms Make Minerals" and "Mineral Groups" presentations.
 - Complete the Geology Matter and Minerals quiz.
 - Read the "Igneous Rocks: Formed by Fire" section in Chapter 3 of Earth Science.
 - Review the "Igneous Rocks" presentation.
 - Review figure 3.7 in the "Classification of Igneous Rocks, Based on Their Mineral Composition and Texture" presentation.



- Review the "Igneous Rock Textures" and "Bowen's Reaction Series" presentations.
- Read the "Sedimentary Rocks: Compacted and Cemented" section of chapter 3 in Earth Science.
- Review the "Sedimentary Rocks" presentation.
- Review the "Sedimentary Environments" presentation.
- Read the "Metamorphic Rocks: New Rock from Old" section of chapter 3 in Earth Science.
- Review the "Metamorphic Rocks" presentation.
- Review figure 3.29 Classification of Common Metamorphic Rock.
- Review the "Foliation Processes" presentation.
- Review the "Metamorphic Rocks, Processes, and Facies" presentation.
- Review chapter 3 in Earth Science.
- Review the "Rock Cycle" interactive tutorial.
- Review the "Rock Cycle" presentation.
- Read the "Energy resources: Fossil Fuels" section in chapter 3 of Earth Science.
- Review "The Fossil Fuel Sequence" presentation.
- Review the "From Plants to Coal" SmartFigure.
- Complete the Geology Rocks Materials of the Solid Earth quiz.
- Review the "Weather Rates" and "Weather and Soil" interactive tutorials.
- Review the "Weathering" presentation
- Read the caption to Figure 4.10.
- Complete the Geology Weathering Soil and Mass Wasting quiz.

Weeks 10-11

- Water, Ice, and Wind
 - Review chapter 5.
 - Review "The Water Cycle" presentation..
 - Review "Running Water" section of chapter 5.
 - Review the "Running Water" presentation.
 - Review "Sediment Transport by Streams" presentation.
 - Review "Meandering" presentation.
 - Review "Groundwater" presentation.
 - Review "Water Table Formation" presentation.
 - Review "Artesian Systems" presentation.
 - Complete the "Geology Running Water and Ground Water quiz.
 - Read the "Glaciers and Glaciation" section in chapter 6
 - Review "Glaciers and Glaciation" presentation.
 - Review "Glacial Processes" presentation.
 - Read chapter 6
 - Review "Deserts and Wind" presentation.
 - Review "Sediment Transport by Wind" presentation.
 - Review "Cross-Bedding" presentation and Crossbeds video.
 - Complete the Geology Glaciers Deserts and Wind Quiz.
- Plate Tectonics.



- Review chapter 7.
- Review "Plate Tectonics" presentation.
- Review "Crust vs. Lithosphere" presentation.
- Review "Divergent Boundaries" presentation.
- Review chapter 7.
- Review "Divergent Boundary Formation" presentation.
- Review "Sea Floor Spreading and Plate Boundaries" presentation.
- Review "Convergent Boundaries" presentation.
- Review "Transform Plate Boundaries" presentation.
- Review "Plate Boundary Features" presentation.
- Review "Motion at Plate Boundaries" presentation.
- Review chapter 7.
- Review "Convection and Tectonics" presentation.
- Review "Hot spot Volcano Tracks" presentation.
- Review chapter 7
- Review "Paleomagnetism - Magnetic Polarity and Polarity Timescales" presentation.
- Review "Time Scale of Magnetic Reversals" presentation.
- Complete the Geology Plate Tectonics Scientific Revolution quiz.
- Earthquakes
 - Read chapter 8.
 - Review "Earthquakes" presentation.
 - Review "Tsunami" presentation.
 - Review "Body Waves (P and S waves) versus Surface Waves" presentation.
 - Review "Seismic Wave Motion" presentation.
 - Review "Seismographs" presentation.
 - Review "Earth's Interior" presentation.
 - Complete the Geology Earthquakes and Earth's Interior quiz.

Week 12

- Volcanoes, Mountains, Folds, Faults, and Maps.
 - Review chapter 9.
 - Review "Volcanoes and Other Igneous Activity" presentation.
 - Review "Igneous Features and Landforms" presentation.
 - Review "Anatomy of a Volcano" presentation.
 - Review "Volcano Types" presentation.
 - Review "Tectonic Settings and Volcanic Activity" presentation.
 - Complete the Geology Volcanoes and Other Igneous Activity quiz.
 - Review chapter 10.
 - Review "Mountain Building" presentation.
 - Review "Common Types of Folds" presentation.
 - Review "Faults" presentation.
 - Review chapter 10.
 - Review "Terrane Formation" presentation.
 - Review "Collision and Accretion of small Crustal Fragments to a Continental



- Margin" presentation.
- Review chapter 10.
- Review "Isostasy" presentation.
- Complete the Geology Crustal Deformation Mountain Build quiz.
- Topographic and Geologic Maps
 - Review "Topographic Maps" presentation.
 - Review the How to Read a Topographic Map website.
 - Review "Geologic Maps" presentation.
 - Review the USGS Geologic Maps website.
- History of Life on Earth
 - Review chapter 11.
 - Review "Fossil Assemblage" presentation.
 - Review section on relative age-dating in chapter 11.
 - Review "Relative Dating - Key Principles" presentation.
 - Review "Relative Geologic Dating" presentation.
 - Review "Angular Uniformities, and Disconformities" presentation.
 - Review "Applying Principles" presentation.
 - Review chapter 12.
 - Review "Geologic Time Scale" presentation.
 - Review "Precambrian" presentation.
 - Review "Paleozoic" presentation.
 - Review "Mesozoic" presentation.
 - Review "Cenozoic" presentation.
 - Complete the Geology Geologic Time quiz.
 - Complete the Geology Earth's Evolution Geologic Time quiz.
- Ocean Features
 - Review chapter 13.
 - Review "Floor of the Ocean" presentation.
 - Review chapter 14.
 - Review "Variations in Surface Temperature and Salinity with Latitude" and "Benthos" presentations.
- Surface Currents and Thermohaline Circulation
 - Review "Ocean Circulation Patterns", the "Connection between Ocean Circulation and Climate of Antarctica", and the "Coastal Upwelling" presentations.
 - Review chapter 15.
 - Review "Coastal Processes", the "Passage of a Wave", the "Beach Drift and Longshore Current", and the "Tidal Patters" presentation.
- Review Acid Rain and Garbage.

Weeks 13-14

- Atmosphere Composition and Structure
 - Read chapter 16.
 - Review "Introduction to the Atmosphere" presentation.
 - Review "Heating Earth's Surface and Atmosphere" presentation.



- Review "The Three Mechanisms of Heat Transfer" presentation.
- Review "Paths Taken by Solar Radiation" presentation.
- Review "Temperature Data and the Controls of Temperature" presentation.
- Read Layers of the Atmosphere.
- Complete the Geology Atmosphere Comp Structure Temp quiz.
- Clouds, Air Pressure, and Weather
 - Read chapter 17.
 - Review "Changes of State Involve and Exchange of Heat" presentation.
 - Review "Moisture and Cloud Formation" presentation.
 - Review "Atmospheric Conditions that Result in Absolute Stability" presentation.
 - Review "Classification of Clouds, Based on Height and Form" presentation.
 - Complete the Geology Moisture Clouds Precipitation quiz.
 - Read chapter 18.
 - Review "Air Pressure Wind" presentation.
 - Review the "Isobars on a Weather Map" presentation.
 - Review "Idealized Global Circulation Proposed for the Three-Cell Circulation Model of a Rotating Earth" presentation.
 - Review the "Jet Stream and Rossby Waves".
 - Review chapter 18.
 - Review "Sea and Land Breezes" presentation.
 - View the "Coriolis Effect", the "Atmospheric Circulation", and the "Storms & Vortices" presentations.
 - Review "Local and Regional Wind Systems" and the "NOAA El Niño Portal" resources

Week 15

- Weather and Climate
 - Read chapter 19.
 - Review "Basic Weather Patterns" presentation.
 - Review "Idealized Structure of a Large, Mature Midlatitude Cyclone" presentation
 - Review the "National Weather Service Online School" resource.
 - Explore the "Today's Weather" interactive.
 - Read chapter 20.
 - Review the "World Climates" and "Climate Feedbacks" resources.
 - Complete the Geology Air Pressure and Wind quiz.

Week 16

- Traditional Astronomy
 - Read chapter 21.
 - Review the "Ptolemy's Explanation of Retrograde Motion" interactive tutorial.
 - Review the "Tycho Brahe" resource.
 - Review the "Using a Telescope, Galileo Discovered That Venus Has Phases Like Earth's Moon"
 - Read Chapter 21.



- Review the "Orbital Motion of Earth and Other Planets" presentation.
- Review the "Characteristics of Solstices and Equinoxes" presentation.
- Review "The Changing Sun Angle" interactive tutorial.
- Review the "Precession of Earth's Axis" presentation.
- Review the "Orbital Variations" interactive tutorial.
- Review the "Phases of the Moon" presentation.
- Review the "Moon Phases", the "What is a Total Solar Eclipse?", and the "What is a Total Lunar Eclipse?" resources.
- Review the "Lunar Eclipse" interactive tutorial.
- Read chapter 21.
- Read chapter 1.
- Review "The Planets: An Overview" presentation.
- Review the "Earth's Moon" presentation.
- Review the "Formation and Filling of Large Impact Basins" presentation.
- Read chapter 22.
- Review the "A Brief Tour of the Planets" presentation.
- Review the "Orbital Motion of Earth and Other Planets" presentation.
- Complete the Geology Touring Solar System quiz.
- Beyond Our Solar System
 - Read chapter 23.
 - Review the "Formation of the Three Types of Spectra" presentation.
 - Review "The Doppler Effect" presentation.
 - Review the "Diagram of Sun's Structure" presentation.
 - Read chapter 24.
 - Review the "Hertzsprung-Russell Diagram" presentation.
 - Review the "Evolutionary Stages of Stars Having Various Masses" presentation.
 - Complete the Geology Light Astronomical Observation Sun quiz.
- Galaxies and the Universe
 - Read chapter 24.
 - Review the "Spiral Galaxies" presentation.
 - Review "Cosmic Microwave Background" resource.
 - Review the "Big Bang Cosmology" video.
 - Review the "Raisin Bread Analogy for an Expanding Universe" presentation..
 - Complete the Geology Beyond Our Solar System quiz.
- Exam Requirements
 - Review the "2834 WGU Cut Scores for Assessments That Require Praxis Examinations" article.
 - Review the "Rest and Service Fees" website.
 - Review the "Praxis Test Centers and Dates" website..
 - Review the "How to Schedule a Praxis Exam" website.
 - Review the "What to Bring" website.
 - Complete the directions found at the "Following Outside Vendor Assessments" website.

Note: This pacing guide does not replace the course. Please continue to refer to the course for a comprehensive list of the resources and activities.



Understanding the Assessment

Understanding the Assessment

Understandably, most people are nervous on exam day. To help reduce any anxiety, you should learn more about the exam experience and how to best prepare.

ETS Middle School Science Praxis Subject Assessment and General Science Praxis Subject Assessment

Watch the following videos to better understand the assessment. The first is an interactive demonstration of how the exam is administered, the tools available during the exam, and the general format of questions.

- [Computer-Delivered Testing Demonstration \(Flash\)](#) | [View Transcript](#)
- [What to Expect on the Day of Your Computer-Delivered Test \(Flash\)](#) (7 minutes)

Watching these videos will help you be prepared for the exam experience, allowing you to demonstrate your Middle School Science or General Science content competency.

Study Companion

ETS created a [Middle School Science Study Companion](#) and [General Science Study Companion](#) to help you prepare for this challenging exam.

Study Plan

Recommended Activities

Follow the guidance in sections 1 ("Learn About Your Test"), 4 ("Determine Your Strategy for Success"), and 5 ("Develop Your Study Plan") in the [Middle School Science Study Companion](#) or [General Science Study Companion](#). Be *honest* with yourself—identify areas in which you are comfortable (and continue to check your competence in these areas), areas that you understand but need more practice, and areas in which you still need to learn the content. Set aside the time that *you* need to ensure success on this exam.

The topics below include resources and activities categorized as follows:

- *Learn*: if a topic is largely new to you, or if it has been several years since you have studied the topic, carefully read the assigned portion of *Middle School Science* or other resources and examine the accompanying visuals. Then continue on to *practice*.



- *Practice*: if you have already learned the topic but struggle with details or recalling specific information, select and interact with the listed tutorials, labs, videos, and other resources targeted to your need. Skim the assigned portion of *Middle School Science* and examine the accompanying visuals. Then continue on the *check*.
- *Check*: complete the quizzes and knowledge checks where provided, even if you already feel confident in your knowledge of a topic. They may highlight areas where you need further *learning* or *practice*.

Read the following sections of this helpful document:

1. Learn About Your Test
2. Familiarize Yourself with Test Questions
3. Practice with Sample Test Questions
4. Determine Your Strategy for Success
5. Develop Your Study Plan
6. Review Smart Tips for Success
7. Understand Your Scores

The [ETS Practice Exam](#) is a full-length practice test that allows you to work through a set of test questions to simulate what you will experience on the actual day of the PRAXIS exam. After a completed attempt, you can view your score and review explanations for the correct answers. You will have unlimited attempts regardless of any notice to the contrary on the ETS website. This practice test includes one set of test questions. Retaking it will not provide different sets of questions or change the order in which they are delivered. If you have any questions, please contact your Course Instructor.

Outside Vendor Assessment

Complete the General Science: Content Knowledge (5435) Praxis Subject Assessment or the Middle School Science (5440) Praxis Subject Assessment. This is a third-party exam offered through ETS. Many states require individuals to pass this exam as part of the teacher certification process. WGU requires you to pass this exam as a program requirement, regardless of the state in which you hold or are seeking certification.

- WGU will pay for your first two attempts of the Praxis exam. You will be responsible for paying for third and subsequent attempts.
- This exam is computer-delivered. WGU will not pay for extended or emergency registration, so be sure to plan ahead when scheduling the exam.
- Visit [Test Centers and Dates](#) to see where and when tests are available in your area.
- You are not allowed a calculator for this exam. You will have access to a Periodic Table of Elements during the exam and you are strongly encouraged to use it.
- In order to receive a pass on your degree plan, you must pass the exam based upon the WGU cut score (generally 150 or higher; check with course instructor). Additionally, if the state in which you seek licensure also requires the Praxis exam, you must pass the exam based on that state's cut score before you will be admitted into Demonstration Teaching or allowed to graduate. Please note that it is possible to pass the exam based



on either the WGU cut score or your state's cut score, and still need to take it again in order to satisfy the other cut score.

- If your state requires you to take a state exam for teacher licensure, you are still required to take the Praxis as a WGU graduation requirement in addition to the state exam you must take for licensure.
- For directions on how to receive access to outside vendor assessments, see "[How to Schedule a Praxis Exam](#)."

Basic Principles of Science

This section covers Life, Earth, and Physical Sciences.

Methodology and Philosophy

You will explore the processes involved in scientific inquiry, the disciplines within science, and scientific terms.

Problem Solving

To review methods of scientific inquiry and how they are used in basic problem solving, read through the following flowchart representing the process of scientific inquiry.

- [How science works: The flowchart](#)

Scientific Tools

In science, data is usually only as good as its measurement tools.

Measurement, Data, and Models

Use the following online library to review processes involved in scientific data collection and manipulation, and how to interpret and draw conclusions from data presented in tables, graphs, and charts:

- [Visionlearning Library](#)

View the topic "Process of Science" from the library menu on the right.

Safety

Providing a safe learning environment is essential in the classroom.

Creating a Safe Environment

Use the following web page to review safety in the classroom.

- [Laboratory Safety](#)

Scientific Ideas Changing Over Time

This section covers some of the scientific contributions made by major historical figures.

Keeping Track of the Major Players

As you work through this course, make note of the major historical figures who have contributed to science.



Use the following web pages to become familiar with Historical developments of science and the contributions of major historical figures.

- [Famous Astronomers](#)
- [Famous Biologists](#)
- [Famous Chemists](#)
- [Famous Physicists](#)
- [Famous Female Scientists](#)

Chemistry

It is essential to have a solid understanding of atomic structure to understand the more complicated content within chemistry. The properties of an atom determine how it reacts with other atoms.

This section reviews basic chemistry concepts.

Please note that for this “Chemistry” section you will need to access eight different chapters from the *Chemistry: Content Knowledge* e-textbook. To access this e-textbook you will need to go to "Preparing for Success" then “Learning Resources” and follow the instructions.

Atomic Models

You will review the connection between atoms and molecules. Once different atoms bond to form compounds, universal names are used for convenience of communication. You need to become familiar with all of the common nomenclature in order to progress in chemistry. This is similar to memorizing the alphabet before you try to read.

Atoms, Molecules, and Ions

Take the chapter 2 end of chapter (EOC) exam in the *Chemistry* text within the OWL resource to check your understanding of the following concepts:

- basic atom structure
- elements, atoms, compounds, molecules, and mixtures
- occurrence and abundance of the elements and their isotopes

If your score is less than 75%, review the following chapter:

- chapter 2 ("Atoms, Molecules, and Ions")

Stoichiometry

You will review the mole concept, as well as how it applies to chemical composition. You will review how to convert between moles, molecules, grams, and elements.

Chemical Equations

Take the chapter 3 end of chapter (EOC) exam in the *Chemistry* text within the OWL resource to check your understanding of the following concept:

- how to balance and use simple chemical equations



If your score is less than 75%, review the following chapter:

- chapter 3 ("Stoichiometry")

Energy

The food people eat provides them with energy. The fuel in a car provides the energy for it to move. The sun provides energy for a plant during photosynthesis. Chemical reactions must account for the energy within the reaction.

You will review various forms of energy in this section.

Forms of Energy

Take the chapter 6 end of chapter (EOC) exam in the *Chemistry* text within the OWL resource to check your understanding of the following concepts:

- basic relationships between energy and matter
- pros and cons of power generation based on various sources

If your score is less than 75%, review the following chapter:

- chapter 6 ("Thermochemistry")

The Structure of Atoms

The periodic table may be the greatest tool ever used by chemists. It was originally used to describe patterns observed in properties of elements before it eventually became apparent that it could also be used to predict patterns in elements.

This section covers atomic structure and periodic trends.

Periodic Trends

Take the chapter 7 end of chapter (EOC) exam in the *Chemistry* text within the OWL resource to check your understanding of the following concept:

- how to use the periodic table to predict the physical and chemical properties of elements

If your score is less than 75%, review the following chapter:

- chapter 7 ("Atomic Structure and Periodicity")

Bonding of Atoms

You will review general bonding concepts. A chemical bond is the energy that holds atoms together. The three types of bonding are ionic bonding, covalent bonding, and polar covalent bonding.

Bonding and Structure

Take the chapter 8 end of chapter (EOC) exam in the *Chemistry* text within the OWL resource to check your understanding of the following concept:



- types of chemical bonding and the composition of simple chemical compounds

If your score is less than 75%, review the following chapter:

- chapter 8 ("Bonding: General Concepts")

Intermolecular Interactions

You will study both intramolecular bonding and intermolecular forces. As the names imply, intramolecular bonding is the chemical bonding that takes place within a molecule to hold the atoms together, and intermolecular bonding takes place between molecules to hold them together into liquids and solids.

Liquids and Solids

Take the chapter 10 end of chapter (EOC) exam in the *Chemistry* text within the OWL resource to check your understanding of the following concepts:

- states of matter and phase changes between them
- solids, liquids, gases, and plasmas

If your score is less than 75%, review the following chapter:

- chapter 10 ("Liquids and Solids")

Solutions and Solubility

You will review the properties of solutions. To give the proper definition of a solution, a number of other terms need to be defined first. It is easiest to start at the beginning. An element is a substance that contains only one type of atom, such as hydrogen (H). A compound is a substance that contains more than one type of element, such as water (H₂O). A mixture is a substance that contains two or more substances, such as sugar dissolved in water, which contains both water molecules and sucrose.

Properties of Solutions

Take the chapter 11 end of chapter (EOC) exam in the *Chemistry* text within the OWL resource to check your understanding of the following concept:

- solutions and solubility

If your score is less than 75%, review the following chapter:

- chapter 11 ("Properties of Solutions")

Acid-Base Chemistry and Equilibrium

You will review the properties of acids and bases. Acid-base reactions are important in organic chemistry. Many of the reactions that take place in organisms involve acid-base reactions. The rate at which you breathe is influenced by the acidity of your blood. Carbonic anhydrase, an organic enzyme, regulates the acidity of your blood. Acid-base reactions also allow you to discuss the importance of solutions and molecular structure in chemical reactions.

Acids and Bases



Take the chapter 14 end of chapter (EOC) exam in the *Chemistry* text within the OWL resource to check your understanding of the following concept:

- basic concepts in acid-base chemistry

If your score is less than 75%, review the following chapter:

- chapter 14 ("Acids and Bases")

Physics

You will learn about the laws that govern linear and rotational motion, forces, momentum, energy, and gravity.

Mechanics

You will study the meaning of force, different ways to categorize force, and Newton's Laws of Motion, you will learn to conceptualize how each law defines motion.

Newton's First Law of Motion

Take the chapter 2 quiz within the *Conceptual Physics* resource to check your understanding of the following concept:

- [Newton's first law: inertia](#)

<https://lrps.wgu.edu/provision/33555724>

If your score is less than 75%, review the following chapter:

- [chapter 2 \("Newton's First Law of Motion: Inertia"\)](#)

Linear Motion

Take the chapter 3 quiz within the *Conceptual Physics* resource to check your understanding of the following concept:

- [describing linear motion in one and two dimensions](#)

<https://lrps.wgu.edu/provision/33556522>

If your score is less than 75%, review the following chapter:

- [chapter 3 \("Linear Motion"\)](#)

Newton's Second Law of Motion

Take the [chapter 4 quiz](#) within the *Conceptual Physics* resource to check your understanding of the following concepts:

- Newton's second law: $f=ma$



- friction

<https://lrps.wgu.edu/provision/33556008>

If your score is less than 75%, review the following chapter:

- [chapter 4 \("Newton's Second Law of Motion"\)](#)

Newton's Third Law of Motion

Take the chapter 5 quiz within the *Conceptual Physics* resource to check your understanding of the following concept:

- [Newton's third law: action-reaction forces](#)

<https://lrps.wgu.edu/provision/33555577>

If your score is less than 75%, review the following chapter:

- [chapter 5 \("Newton's Third Law of Motion"\)](#)

Momentum

Take the [chapter 6 quiz](#) within the *Conceptual Physics* resource to check your understanding of the following concepts:

- conservation of energy and conservation of momentum
- collisions

<https://lrps.wgu.edu/provision/33556533>

If your score is less than 75%, review the following chapter:

- [chapter 6 \("Momentum"\)](#)

Energy

Take the [chapter 7 quiz](#) within the *Conceptual Physics* resource to check your understanding of the following concepts:

- work, energy, and power
- simple machines and mechanical advantage

<https://lrps.wgu.edu/provision/33555983>

If your score is less than 75%, review the following chapter:

- [chapter 7 \("Energy"\)](#)

Rotational Motion



Take the chapter 8 quiz within the *Conceptual Physics* resource to check your understanding of the following concept:

- [circular motion in one and two dimensions](#)

<https://lrps.wgu.edu/provision/33555635>

If your score is less than 75%, review the following chapter:

- [chapter 8 \("Rotational Motion"\)](#)

Gravity

Take the chapter 9 exam within the *Conceptual Physics* resource to check your understanding of the following concept:

- [mass, weight, and gravity](#)

<https://lrps.wgu.edu/provision/33555788>

If your score is less than 75%, review the following chapter:

- [chapter 9 \("Gravity"\)](#)

Projectiles

Take the [chapter 10 quiz](#) within the *Conceptual Physics* resource to check your understanding of the following concepts:

- projectile motion
- planetary orbits

<https://lrps.wgu.edu/provision/33555627>

If your score is less than 75%, review the following chapter:

- [chapter 10 \("Projectile and Satellite Motion"\)](#)

Properties of Matter

This section covers the properties of fluids.

Fluids

Take the chapter 13 quiz within the *Conceptual Physics* resource to check your understanding of the following concept:

- [physical properties of fluids](#)

<https://lrps.wgu.edu/provision/33555342>



If your score is less than 75%, review the following chapter:

- [chapter 13 \("Liquids"\)](#)

Waves

You will learn about the basic properties of waves and how they apply to sound and the Doppler effect.

Vibrations and Waves

Take the [chapter 19 quiz](#) within the *Conceptual Physics* resource to check your understanding of the following concepts:

- basic characteristics of waves
- Doppler effect

<https://lrps.wgu.edu/provision/33556564>

If your score is less than 75%, review the following chapter:

- [chapter 19 \("Vibrations and Waves"\)](#)

Sound

Take the chapter 20 quiz within the *Conceptual Physics* resource to check your understanding of the following concept:

- [basic characteristics and phenomena of sound](#)

<https://lrps.wgu.edu/provision/33555374>

If your score is less than 75%, review the following chapter:

- [chapter 20 \("Sound"\)](#)

Electromagnetism

You will learn about the laws, principles, and concepts that describe electrostatics, electric current, and magnetism. You will learn how these concepts are similar and related.

Electricity and Magnetism

Take the chapter 22 quiz within the *Conceptual Physics* resource to check your understanding of the following concept:

- [electrical nature of materials](#)

<https://lrps.wgu.edu/provision/33555516>

If your score is less than 75%, review the following chapter:



- [chapter 22 \("Electricity and Magnetism"\)](#)

Electric Current

Take the chapter 23 quiz within the *Conceptual Physics* resource to check your understanding of the following concept:

- [analyzing basic series and parallel electrical circuits](#)

<https://lrps.wgu.edu/provision/33556446>

If your score is less than 75%, review the following chapter:

- [chapter 23 \("Electric Current"\)](#)

Magnetism

Take the chapter 24 quiz within the *Conceptual Physics* resource to check your understanding of the following concept:

- [magnetic fields and forces](#)

<https://lrps.wgu.edu/provision/33555935>

If your score is less than 75%, review the following chapter:

- [chapter 24 \("Magnetism"\)](#)

Application of Light

This section covers the application of light. You will learn how to analyze situations that include the reflection, refraction, diffraction, and/or scattering of light.

Light

Take the [chapter 25](#) and [26 quizzes](#) within the *Conceptual Physics* resource to check your understanding of the following concepts:

- characteristics of light and the electromagnetic spectrum
- absorption and transmission

<https://lrps.wgu.edu/provision/33555878>

<https://lrps.wgu.edu/provision/33556350>

If your score is less than 75%, review the following chapters:

- [chapter 25 \("Light"\)](#)
- [chapter 26 \("Color"\)](#)

Basic Optics



Take the [chapter 28 quiz](#) within the *Conceptual Physics* resource to check your understanding of the following concepts:

- basic optics
- reflection, refraction, dispersion

<https://lrps.wgu.edu/provision/33556139>

If your score is less than 75%, review the following chapters:

- [chapter 28 \("Reflection and Refraction"\)](#)

Light Waves

Take the [chapter 29 quiz](#) within the *Conceptual Physics* resource to check your understanding of the following concepts:

- interference, scattering, and polarization
- diffraction

<https://lrps.wgu.edu/provision/33555870>

If your score is less than 75%, review the following chapters:

- [chapter 29 \("Light Waves"\)](#)

Life Sciences

This section covers the Life Science content using the MindTap Cengage learning resource.

Life Sciences

You will use the MindTap Cengage learning resource to review the life science content. This same resource is referenced within the Principles of Biology course in your program.

Life Sciences

Read the following chapters from the Biology ebook within the [MindTap Cengage learning resource](#). Access the ebook using the blue book icon on the right hand side.

After reading a chapter, complete the Self Quiz at the end of the chapter. If you want to discuss any content, contact the Biology Course Instructors at this address biology@wgu.edu.

- chapter 1 ("Invitation to Biology")
- chapter 3 ("Molecules of Life")
- chapter 4 ("Cell Structure")
- chapter 6 ("Where It Starts – Photosynthesis")
- chapter 7 ("How Cells Release Chemical Energy")
- chapter 8 ("DNA Structure and Function")
- chapter 9 ("From DNA to Protein")



- chapter 11 ("How Cells Reproduce")
- chapter 12 ("Meiosis and Sexual Reproduction")
- chapter 13 ("Observing Patterns in Inherited Traits")
- chapter 16 ("Evidence of Evolution")
- chapter 17 ("Processes of Evolution")
- chapter 25 ("Plant Tissues")
- chapter 28 ("Animal Tissues and Organ Systems")
- chapter 40 ("Population Ecology")
- chapter 41 ("Community Ecology")
- chapter 42 ("Ecosystems")
- chapter 43 ("The Biosphere")

Earth and Space Sciences

Earth and Space Sciences involve the study of geology, oceanography, meteorology, and astronomy.

Minerals, Rocks, and Rock Cycle

This topic addresses the following competency:

Competency 204.5.2: Geology

The graduate has a broad understanding of the principles of geology.

Minerals

Read the beginning of the following chapter in Earth Science:

- [chapter 2 \("Matter and Minerals"\)](#)

Review the following presentation on "Minerals:"

- [Minerals](#)

<https://lrps.wgu.edu/provision/34044723>

Definition of a Mineral

Review the following interactive tutorial on "Most Rocks Are Aggregates of Minerals:"

- [Most Rocks Are Aggregates of Minerals](#)

<https://lrps.wgu.edu/provision/33482753>

Properties of Minerals

Review the following sections in [chapter 2 \("Matter and Minerals"\)](#) in *Earth Science*:

- "Properties of Minerals"
- "Mineral Groups"



Review the following presentation on “Hardness Scales:”

Review figure 2.24 ("Common Silicate Minerals") and Table 2.1 ("Non-Silicate Minerals Groups") in the following SmartFigure:

- [Hardness Scales](#)

Review the following presentations:

- [Atoms Make Minerals](#)
- [Mineral Groups](#)

Using the following resource, identify mineral samples 5, 10, 15 & 20:

- [Using Characteristics of Minerals to Identify Them](#)

Minerals Quiz

Complete the Geology Matter and Minerals quiz:

- [Geology Matter and Minerals quiz](#)

<https://lrps.wgu.edu/provision/33619769>

Igneous Rocks

Read the following section in [chapter 3 \("Rocks: Materials of the Solid Earth"\)](#) of *Earth Science*:

- "Igneous Rocks: Formed by Fire"

Review the following presentation on “Igneous Rocks:”

- [Igneous Rocks](#)

<https://lrps.wgu.edu/provision/34044742>

You should be able to identify at least six common igneous rocks as found in figure 3.7 ("Classification of Igneous Rocks, Based on their Mineral Composition and Texture") from the following SmartFigure:

Review the following presentation on “Classification of Igneous Rocks, Based on Their Mineral Composition and Texture:”

- [Classification of Igneous Rocks, Based on Their Mineral Composition and Texture](#)

<https://lrps.wgu.edu/provision/33483018>

View the following presentations:



- [Igneous Rock Textures](#)
- [Bowen's Reaction Series](#)

Sedimentary Rocks

Read the following section in [chapter 3 \("Rocks: Materials of the Solid Earth"\)](#) of *Earth Science*:

- "Sedimentary Rocks: Compacted and Cemented"

Review the following presentation on "Sedimentary Rocks:"

- [Sedimentary Rocks](#)

<https://lrps.wgu.edu/provision/34044754>

View the following presentation:

- [Sedimentary Environments](#)

Metamorphic Rocks

Read the following section in [chapter 3 \("Rocks: Materials of the Solid Earth"\)](#) of *Earth Science*:

- "Metamorphic Rocks: New Rock from Old"

Review the following presentation on "Metamorphic Rocks:"

- [Metamorphic Rocks](#)

<https://lrps.wgu.edu/provision/34044674>

You should be able to identify five common metamorphic rocks as shown in the following figure of *Earth Science*:

- figure 3.29 Classification of Common Metamorphic Rock

Review the following interactive tutorial to familiarize yourself with the sequence of foliation for metamorphic rocks:

- [Foliation Processes](#)

<https://lrps.wgu.edu/provision/33483272>

View the following presentation:

- [Metamorphic Rocks, Processes, and Facies](#)

Rock Cycle



Review the beginning of the following chapter in *Earth Science*:

- [chapter 3 \("Rocks: Materials of the Solid Earth"\)](#)

Review the following interactive tutorial on the "Rock Cycle:"

- [Rock Cycle](#)

<https://lrps.wgu.edu/provision/33483328>

View the following presentation on the "Rock Cycle:"

- [Rock Cycle](#)

Environmental Impact of Resource Extraction

Read the following section in [chapter 3 \("Rocks: Materials of the Solid Earth"\)](#) of *Earth Science*:

- "Energy Resources: Fossil Fuels"

Watch the following presentation:

- [The Fossil Fuel Sequence](#)

Review the following SmartFigure:

- [Overview of Mining and its Impacts](#)

Rock Cycle & Rocks Quiz

Complete the Geology Rocks Materials of the Solid Earth quiz:

- [Geology Rocks Materials of the Solid Earth quiz](#)

<https://lrps.wgu.edu/provision/33619209>

Weathering, Soil, and Mass Wasting

Review the following Interactive Tutorials on "Weathering Rates" and "Weather and Soil:"

- [Weathering Rates](#)
- [Weather and Soil](#)

<https://lrps.wgu.edu/provision/33483549>

<https://lrps.wgu.edu/provision/34044678>

View the following presentation:



- [Weathering](#)

Read the caption to [Figure 4.10 \(limestone cherub\)](#) and explain what happens with acid precipitation.

Weathering, Soil and Mass Wasting Quiz

Complete the Geology Weathering Soil and Mass Wasting quiz:

- [Geology Weathering Soil and Mass Wasting quiz](#)

<https://lrps.wgu.edu/provision/33619617>

Water, Ice, and Wind

This topic addresses the following competency:

- **Competency 204.5.2: Geology**

The graduate has a broad understanding of the principles of geology.

The Water Cycle

Read the following chapter of *Earth Science*:

- [chapter 5 \("Running Water and Groundwater"\)](#)

View the following presentation on "The Water Cycle:"

- [The Water Cycle](#)

<https://lrps.wgu.edu/provision/33483655>

Surface Water: Meandering and Braided Streams

Read the following section in [chapter 5 \("Running Water and Groundwater"\)](#) of *Earth Science*:

View the following presentation on "Running Water:"

- [Running Water](#)

<https://lrps.wgu.edu/provision/34044804>

View the following presentation on "Sediment Transport by Streams:"

- [Sediment Transport by Streams](#)

<https://lrps.wgu.edu/provision/33483845>

View the following presentation on "Meandering:"



- [Meandering](#)

<https://lrps.wgu.edu/provision/33483729>

Groundwater: Aquifers and Artesian Wells

View the following presentation on “Groundwater:”

- [Groundwater](#)

<https://lrps.wgu.edu/provision/34044688>

View the following presentation on “Water Table Formation:”

- [Water Table Formation](#)

<https://lrps.wgu.edu/provision/33483951>

View the following presentation on “Artesian Systems:”

- [Artesian Systems](#)

<https://lrps.wgu.edu/provision/33483794>

Geology Running Water and Ground Water Quiz

Complete the following quiz:

- [Geology Running Water and Ground Water Quiz](#)

<https://lrps.wgu.edu/provision/33619724>

Ice and Glaciers

Read the following section in [chapter 6 \("Glaciers, Deserts, and Wind"\)](#) of *Earth Science*:

View the following presentation on “Glaciers and Glaciation:”

- [Glaciers and Glaciation](#)

<https://lrps.wgu.edu/provision/34044832>

View the following presentation on “Glacial Processes:”

- [Glacial Processes](#)

<https://lrps.wgu.edu/provision/33484254>

Wind and Deserts



Read the following section in [chapter 6 \("Glaciers, Deserts, and Wind"\)](#) of *Earth Science*:

View the following presentation on “Deserts and Wind:”

- [Deserts and Wind](#)

<https://lrps.wgu.edu/provision/34044861>

View the following presentation on “Sediment Transport by Wind:”

- [Sediment Transport by Wind](#)

<https://lrps.wgu.edu/provision/33484303>

View the following presentation on “Cross-Bedding:”

- [Cross-Bedding](#)

<https://lrps.wgu.edu/provision/33484324>

Video: [Crossbeds](#)

Glaciers, Deserts, and Wind Quiz

Complete the following quiz:

- [Geology Glaciers Deserts and Wind Quiz](#)

<https://lrps.wgu.edu/provision/33619665>

Plate Tectonics

This topic addresses the following competency:

- **Competency 204.5.2: Geology**

The graduate has a broad understanding of the principles of geology.

Plate Tectonics

Read the following sections in [chapter 7 \("Plate Tectonics: A Scientific Revolution Unfolds"\)](#) of *Earth Science*:

View the following presentation on “Plate Tectonics:”

- [Plate Tectonics](#)

<https://lrps.wgu.edu/provision/34044867>

View the following presentation on “Crust vs. Lithosphere:”



- [Crust vs. Lithosphere](#)

<https://lrps.wgu.edu/provision/33484417>

View the following presentation on “Divergent Boundaries:”

- [Divergent Boundaries](#)

<https://lrps.wgu.edu/provision/33484421>

Plate Boundaries

Read about the types of plate boundaries (i.e., divergent, convergent, and transform) in the following chapter of *Earth Science*:

- [chapter 7 \("Plate Tectonics: A Scientific Revolution Unfolds"\)](#)

View the following presentation on “Divergent Boundary Formation:”

- [Divergent Boundary Formation](#)

<https://lrps.wgu.edu/provision/33484594>

View the following presentation on “Sea Floor Spreading and Plate Boundaries:”

- [Sea Floor Spreading and Plate Boundaries](#)

<https://lrps.wgu.edu/provision/33484540>

View the following presentation on “Convergent Boundaries:”

- [Convergent Boundaries](#)

<https://lrps.wgu.edu/provision/33484436>

View the following presentation on “Transform Plate Boundaries:”

- [Transform Plate Boundaries](#)

<https://lrps.wgu.edu/provision/33484485>

View the following presentation on “Plate Boundary Features:”

- [Plate Boundary Features](#)

<https://lrps.wgu.edu/provision/33484646>



View the following presentation on “Motion at Plate Boundaries:”

- [Motion at Plate Boundaries](#)

<https://lrps.wgu.edu/provision/33484587>

Geologic Hot Spots

Read about geologic hot spots (sometimes called mantle plumes or intraplate volcanism) in the following chapter of *Earth Science*:

- [chapter 7 \("Plate Tectonics: A Scientific Revolution Unfolds"\)](#)

View the following presentation on “Convection and Tectonics:”

- [Convection and Tectonics](#)

<https://lrps.wgu.edu/provision/33484567>

View the following presentation on “Hot spot Volcano Tracks:”

- [Hot spot Volcano Tracks](#)

<https://lrps.wgu.edu/provision/33484692>

Magnetic Stripes on the Ocean Floor

Read [chapter 7 \("Plate Tectonics: A Scientific Revolution Unfolds"\)](#) of *Earth Science*

View the following presentation on “Paleomagnetism – Magnetic Polarity and Polarity Timescales:”

- [Paleomagnetism – Magnetic Polarity and Polarity Timescales](#)

<https://lrps.wgu.edu/provision/34077729>

View the following presentation on “Time Scale of Magnetic Reversals:”

- [Time Scale of Magnetic Reversals](#)

<https://lrps.wgu.edu/provision/33484501>

Plate Tectonics Quiz

Complete the Geology Plate Tectonics Scientific Revolution quiz:

- [Geology Plate Tectonics Scientific Revolution Quiz](#)

<https://lrps.wgu.edu/provision/33619603>



Earthquakes & Interior Structure

This topic addresses the following competency:

- **Competency 204.5.2: Geology**

The graduate has a broad understanding of the principles of geology.

Earthquakes

Read the following chapter of *Earth Science*:

- [chapter 8 \("Earthquakes and Earth's Interior"\)](#)

View the following presentation on "Earthquakes:"

- [Earthquakes](#)

<https://lrps.wgu.edu/provision/34044890>

View the following presentation on "Tsunami:"

- [Tsunami](#)

<https://lrps.wgu.edu/provision/33484908>

Seismology

View the following presentation on "Body Waves (P and S waves) versus Surface Waves:"

- [Body Waves \(P and S waves\) versus Surface Waves](#)

<https://lrps.wgu.edu/provision/33484738>

View the following presentation on "Seismic Wave Motion:"

- [Seismic Wave Motion](#)

<https://lrps.wgu.edu/provision/33484839>

View the following presentation on "Seismographs:"

- [Seismographs](#)

<https://lrps.wgu.edu/provision/33484824>

Earth's Interior

View the following presentation on "Earth's Interior:"



- [Earth's Interior](#)

<https://lrps.wgu.edu/provision/34044901>

Earthquakes & Earth's Interior Quiz

Complete the Geology Earthquakes and Earths Interior quiz:

- [Geology Earthquakes and Earths Interior quiz](#)

<https://lrps.wgu.edu/provision/33619293>

Volcanoes, Mountains, Folds, Faults, and Maps

This topic addresses the following competency:

- **Competency 204.5.2: Geology**

The graduate has a broad understanding of the principles of geology.

Volcanoes

Read the following chapter in *Earth Science*:

- [chapter 9 \("Volcanoes and Other Igneous Activity"\)](#)

View the following presentation on "Volcanoes and Other Igneous Activity:"

- [Volcanoes and Other Igneous Activity](#)

<https://lrps.wgu.edu/provision/34044944>

View the following presentation on "Igneous Features and Landforms:"

- [Igneous Features and Landforms](#)

<https://lrps.wgu.edu/provision/33485407>

View the following presentation on "Anatomy of a Volcano:"

- [Anatomy of a Volcano](#)

<https://lrps.wgu.edu/provision/33485226>

View the following presentation on "Volcano Types:"

- [Volcano Types](#)

<https://lrps.wgu.edu/provision/33485369>



View the following presentation on “Tectonic Settings and Volcanic Activity:”

- [Tectonic Settings and Volcanic Activity](#)

<https://lrps.wgu.edu/provision/33485326>

Volcanoes Quiz

Complete the Geology Volcanoes and Other Igneous Activity quiz:

- [Geology Volcanoes and Other Igneous Activity Quiz](#)

<https://lrps.wgu.edu/provision/33619532>

Mountains, Folds, & Faults

Read the following chapter in *Earth Science*:

- [chapter 10 \("Crustal Deformation and Mountain Building"\)](#)

View the following presentation on “Mountain Building:”

- [Mountain Building](#)

<https://lrps.wgu.edu/provision/34044975>

View the following presentation on “Common Types of Folds:”

- [Common Types of Folds](#)

<https://lrps.wgu.edu/provision/33485522>

View the following presentation on “Faults:”

- [Faults](#)

<https://lrps.wgu.edu/provision/33485015>

Accreted Terranes

Read the following chapter in *Earth Science*:

- [chapter 10 \("Mountain Building"\)](#)

View the following presentation on “Terrane Formation:”

- [Terrane Formation](#)

<https://lrps.wgu.edu/provision/33485053>



View the following presentation on “Collision and Accretion of small Crustal Fragments to a Continental Margin:”

- [Collision and Accretion of small Crustal Fragments to a Continental Margin](#)

<https://lrps.wgu.edu/provision/33485630>

Isostasy

Read the following chapter in *Earth Science*:

- [chapter 10 \("Mountain Building"\)](#)

View the following presentation on “Isostasy:”

- [Isostasy](#)

<https://lrps.wgu.edu/provision/34077615>

Mountains Quiz

Complete the Geology Crustal Deformation Mountain Build quiz:

- [Geology Crustal Deformation Mountain Build Quiz](#)

<https://lrps.wgu.edu/provision/33619525>

Topographic and Geologic Maps

This topic addresses the following competency:

- **Competency 204.5.2: Geology**

The graduate has a broad understanding of the principles of geology.

Topographic Maps

Watch the following presentation:

- [Topographic Maps](#)

Note: To download this video, right-click the following link and choose "Save as...": [download video](#).

Visit the following website:

- [How to Read a Topographic Map](#)

Geologic Maps

Watch the following presentation:



- [Geologic Maps](#)

Note: To download this video, right-click the following link and choose "Save as...": [download video](#).

Explore the following website:

- [USGS Geologic Maps](#)

History of Life on Earth

Complete the following:

Fossils

Read [chapter 11 \("Geologic Time"\)](#) of *Earth Science*.

View the following presentation on "Fossil Assemblage:"

- [Fossil Assemblage](#)

<https://lrps.wgu.edu/provision/33485930>

Relative Age-Dating

Read the section on relative age-dating in [chapter 11 \("Geologic Time"\)](#) in *Earth Science*.

View the following presentation on "Relative Dating – Key Principles:"

- [Relative Dating – Key Principles](#)

<https://lrps.wgu.edu/provision/33486060>

View the following presentation on "Relative Geologic Dating:"

- [Relative Geologic Dating](#)

<https://lrps.wgu.edu/provision/33485979>

View the following presentation on "Angular Unconformities, Nonconformities, and Disconformities:"

- [Angular Unconformities, Nonconformities, and Disconformities](#)

<https://lrps.wgu.edu/provision/33486017>

View the following presentation on "Applying Principles:"

- [Applying Principles](#)



<https://lrps.wgu.edu/provision/33485923>

Radiometric (Isotopic) Age-Dating

Read the section on radiometric (isotopic, sometime called absolute) age-dating in [chapter 11](#) of *Earth Science*.

Next, view the following video on [Radiometric Age-Dating](#).

After viewing the video, practice your skills and complete the [Radiometric Age-Dating Simulation](#). NOTE: Be certain to watch the video before participating in the simulation. You can complete the simulation as many times as you would like.

View the following presentation on “Dating with Radioactivity:”

- [Dating with Radioactivity](#)

<https://lrps.wgu.edu/provision/33486100>

View the following presentation on “Radioactive Decay:”

- [Radioactive Decay](#)

<https://lrps.wgu.edu/provision/33486036>

View the following presentation on “Radioactive Decay Curve:”

- [Radioactive Decay Curve](#)

<https://lrps.wgu.edu/provision/33485966>

Geologic Time Scale

Read the following chapter in [chapter 12](#) (“*Earth's Evolution through Geologic Time*”) of *Earth Science*:

View the following presentation on “Geologic Time Scale:”

- [Geologic Time Scale](#)

<https://lrps.wgu.edu/provision/33486052>

Watch the following presentations:

- [Precambrian](#)
- [Paleozoic](#)
- [Mesozoic](#)
- [Cenozoic](#)



Note: To download these videos, right-click the following link and choose "Save as...": [download video](#).

Geologic Time & History of Life Quizzes

Complete the Geology Geologic Time and Geology Earth's Evolution Geologic Time quizzes:

- [Geology Geologic Time Quiz](#)
- [Geology Earth's Evolution Geologic Time Quiz](#)

<https://lrps.wgu.edu/provision/33619429>

<https://lrps.wgu.edu/provision/33619142>

Oceans & Atmospheres

Outgassing of gases and fluids through volcanic vents provided the raw materials to form Earth's hydrosphere and atmosphere. Geologic and biologic processes, including human activities, continue to modify the planet's water and air.

Ocean Features

This topic addresses the following competency:

- **Competency 204.5.4: Oceanography**
The graduate has a broad understanding of the basic concepts of oceanography.

The Ocean Floor

Read the following chapter of *Earth Science*:

- [chapter 13 \("The Ocean Floor"\)](#)

Review the following:

- [Ocean Floor Features](#)
- [The Floor of the Ocean Comes into Better Focus](#)

Read the following chapter of *Earth Science*:

- [chapter 14 \("Ocean Water and Ocean Life"\)](#)

Review the following:

- ["Variations in Surface Temperature and Salinity with Latitude"](#)
- ["Benthos"](#)

Surface Currents and Thermohaline Circulation

This topic addresses the following competency:

- **Competency 204.5.4: Oceanography**



The graduate has a broad understanding of the basic concepts of oceanography.

Surface Currents

Review the following:

- ["Ocean Circulation Patterns"](#)
- ["Connection between Ocean Circulation and Climate of Antarctica"](#)
- ["Coastal Upwelling"](#)

Coastal Processes and Tides

Read the following chapter of *Earth Science*:

- [chapter 15 \("The Dynamic Ocean"\)](#) of *Earth Science*

Review the following:

- ["Coastal Geological Processes"](#)
- ["Passage of a Wave"](#)
- ["Beach Drift and Longshore Current"](#)
- ["Tidal Patterns"](#)

Atmosphere Composition and Structure

This topic addresses the following competency:

- **Competency 204.5.3: Meteorology**

The graduate has a broad understanding of the concepts of meteorology.

Introduction to the Atmosphere

Read the following chapter of *Earth Science*:

- [chapter 16 \("The Atmosphere: Composition, Structure, and Temperature"\)](#)

View the following presentation on "Introduction to the Atmosphere:"

- [Introduction to the Atmosphere](#)

<https://lrps.wgu.edu/provision/34045059>

View the following presentation on "Heating Earth's Surface and Atmosphere:"

- [Heating Earth's Surface and Atmosphere](#)

<https://lrps.wgu.edu/provision/34045069>

View the following presentation on "The Three Mechanisms of Heat Transfer:"



- [The Three Mechanisms of Heat Transfer](#)

<https://lrps.wgu.edu/provision/33486808>

View the following presentation on “Paths Taken by Solar Radiation:”

- [Paths Taken by Solar Radiation](#)

<https://lrps.wgu.edu/provision/33486816>

View the following presentation on “Temperature Data and the Controls of Temperature:”

- [Temperature Data and the Controls of Temperature](#)

<https://lrps.wgu.edu/provision/33487035>

Read the following:

- [Layers of the Atmosphere](#)

Atmosphere Quiz

Complete the Geology Atmosphere Comp Structure Temp quiz:

- [Geology Atmosphere Comp Structure Temp Quiz](#)

<https://lrps.wgu.edu/provision/33619156>

Clouds, Air Pressure, and Weather

This topic addresses the following competency:

- **Competency 204.5.3: Meteorology**

The graduate has a broad understanding of the concepts of meteorology.

Clouds

Read the following chapter of *Earth Science*:

- [chapter 17 \("Moisture, Clouds, and Precipitation"\)](#)

View the following presentation on “Changes of State Involve an Exchange of Heat:”

- [Changes of State Involve an Exchange of Heat](#)

<https://lrps.wgu.edu/provision/33487070>

View the following presentation on “Moisture and Cloud Formation:”



- [Moisture and Cloud Formation](#)

<https://lrps.wgu.edu/provision/34045104>

View the following presentation on “Atmospheric Conditions that Result in Absolute Stability:”

- [Atmospheric Conditions that Result in Absolute Stability](#)

<https://lrps.wgu.edu/provision/33487190>

View the following presentation on “Classification of Clouds, Based on Height and Form:”

- [Classification of Clouds, Based on Height and Form](#)

<https://lrps.wgu.edu/provision/33487198>

Video: [How to read Tables for Relative Humidity and Dew Point](#)
Clouds Quiz

Complete the Geology Moisture Clouds Precipitation quiz:

- [Geology Moisture Clouds Precipitation Quiz](#)

<https://lrps.wgu.edu/provision/33619241>

Air Pressure and Coriolis Effect

Read the following chapter of *Earth Science*:

- [chapter 18 \("Air Pressure and Wind"\)](#)

View the following presentation on “Air Pressure and Wind:”

- [Air Pressure and Wind](#)

<https://lrps.wgu.edu/provision/34045167>

View the following presentation on “Isobars on a Weather Map:”

- [Isobars on a Weather Map](#)

<https://lrps.wgu.edu/provision/33487893>

Coriolis Effect

View the following presentation on “Idealized Global Circulation Proposed for the Three-Cell Circulation Model of a Rotating Earth:”



- [Idealized Global Circulation Proposed for the Three-Cell Circulation Model of a Rotating Earth](#)

<https://lrps.wgu.edu/provision/33487940>

Review the following:

- [What is a Rossby wave?](#)

Local Winds

Read the following chapter of *Earth Science*:

- [chapter 18 \("Air Pressure and Wind"\)](#)

Review the following:

- ["Sea and Land Breezes"](#)

Watch the following videos:

- [Coriolis Effect](#)
- [Atmospheric Circulation](#)
- [Storms & Vortices](#)

Read and explore the following resources:

- [Local and Regional Wind Systems](#)
- [NOAA El Nino Portal](#)

Weather and Climate

This topic addresses the following competency:

- **Competency 204.5.3: Meteorology**
The graduate has a broad understanding of the concepts of meteorology.

Weather and Climate

Read the following chapter of *Earth Science*:

- [chapter 19 \("Weather Patterns and Severe Storms"\)](#)

View the following presentation on "Basic Weather Patterns:"

- [Basic Weather Patterns](#)

<https://lrps.wgu.edu/provision/34045185>



View the following presentation on “Idealized Structure of a Large, Mature Midlatitude Cyclone:”

- [Idealized Structure of a Large, Mature Midlatitude Cyclone](#)

<https://lrps.wgu.edu/provision/33488053>

Read and explore the following resource:

- [National Weather Service Online School](#)

Practice reading the weather maps in your local area with the following interactive:

- [Today's Weather](#)

Anthropogenic Climate Change

Read about human impact on global climate in the following section of [chapter 20 \("World Climates and Global Climate Change"\)](#) of *Earth Science*:

- Section 20.8 "Human Impact on Global Climate Change"

Read and explore the following resources:

- [World Climates](#)
- [Climate Feedbacks](#)

Air Pressure and Weather Quiz

Complete the Geology Air Pressure and Wind quiz:

- [Geology Air Pressure and Wind Quiz](#)

<https://lrps.wgu.edu/provision/33619805>

Space Sciences

Space Sciences involve the study of traditional astronomy, our solar system, galaxies, and the universe.

Traditional Astronomy

This topic addresses the following competency:

- **Competency 204.5.1: Astronomy**

The graduate has a broad understanding of the basic concepts of astronomy.

Astronomy

Read the following chapter in *Earth Science*:



- [chapter 21 \("Origin of Modern Astronomy"\)](#)

Planetary Motion

Read and explore the following resources:

- [\(SmartFigure: Epicycles and Retrograde Motion\)](#) Interactive Tutorial: Ptolemy's Explanation of Retrograde Motion
- [Tycho Brahe](#)

Using a Telescope, Galileo Discovered That Versus Has Phases Like Earth's Moon

View the following presentation on “Using a Telescope, Galileo Discovered That Versus Has Phases Like Earth’s Moon:”

- [Using a Telescope, Galileo Discovered That Versus Has Phases Like Earth's Moon](#)

<https://lrps.wgu.edu/provision/33488378>

To review this shape, refer to the following figure in [chapter 21](#) in Earth Science, which depicts two different ellipses:

- figure 21.10 Drawing Ellipses with Various Eccentricities

The eccentricity of an ellipse is dependent on the distance between the foci. If the distance between the foci were zero, what shape would the ellipse have?

Earth's path around the sun is almost a circle, but not quite. Asteroids and comets have more eccentric paths around the sun than the earth does.

Look at the following figure in [chapter 21](#) in Earth Science to review Kepler's law of equal areas:

- figure 21.11 Kepler's Law of Equal Areas

A comet far from the sun at aphelion moves slowly. Conversely, when the comet is close to the sun at perihelion, it moves quickly and also has a tail as the sun burns off some of the comet's ice.

View the following presentation on “Orbital Motion of Earth and Other Planets:”

- [Orbital Motion of Earth and Other Planets](#)

<https://lrps.wgu.edu/provision/33488413>

Earth's Tilt Axis

Earth is tilted with respect to the Sun. Two main results of that tilt angle are seasons and precession.



View the following presentation on “Characteristics of the Solstices and Equinoxes:”

- [Characteristics of the Solstices and Equinoxes](#)

<https://lrps.wgu.edu/provision/33486760>

Review the following:

- [Interactive Tutorial: The Changing Sun Angle \(SmartFigure: Sun Angle\)](#)

View the following presentation on “Precession of Earth’s Axis:”

- [Precession of Earth’s Axis](#)

<https://lrps.wgu.edu/provision/33488489>

Review the following:

- [Interactive Tutorial: Orbital Variations \(SmartFigure: Orbital Forcing of Ice Ages\)](#)

Earth-Moon-Sun Relationships

As the moon orbits the earth and the earth orbits the sun, the lineup of these three bodies cause phases of the moon as well as eclipses.

View the following presentation on “Phases of the Moon:”

- [Phases of the Moon](#)

<https://lrps.wgu.edu/provision/33488525>

Read and explore the following resources:

- [Moon Phases](#)
- [What is a Total Solar Eclipse?](#)
- [What is a Total Lunar Eclipse](#)

Review the following:

- [Interactive Tutorial: Lunar Eclipse \(SmartFigure: Eclipses\)](#)

Solar System

Examine the following table in [chapter 21 \("Origins of Modern Astronomy"\)](#) of *Earth Science* to see the distance of the planets from the sun:



- table 21.1 ("Period of Revolution and Solar Distances of Planets")

Evolution of Earth and Moon

Read the following section in [chapter 1 \("Introduction to Earth Science"\)](#) of *Earth Science*:

- Section 1.3 "Early Evolution of the Earth"

View the following presentation on "The Planets: An Overview:"

- [The Planets: An Overview](#)

<https://lrps.wgu.edu/provision/33488742>

View the following presentation on "Earth's Moon:"

- [Earth's Moon](#)

<https://lrps.wgu.edu/provision/33488748>

View the following presentation on "Formation and Filling of Large Impact Basins:"

- [Formation and Filling of Large Impact Basins](#)

<https://lrps.wgu.edu/provision/33488647>

New Solar System Tour

Read the following chapter in *Earth Science*:

- [chapter 22 \("Touring Our Solar System"\)](#)

View the following presentation on "A Brief Tour of the Planets:"

- [A Brief Tour of the Planets](#)

<https://lrps.wgu.edu/provision/33488755>

View the following presentation on "Orbital Motion of Earth and Other Planets:"

- [Orbital Motion of Earth and Other Planets](#)

<https://lrps.wgu.edu/provision/34451484>

Solar System Tour Quiz

Complete the Geology Touring Solar System quiz:

- [Geology Touring Solar System Quiz](#)



<https://lrps.wgu.edu/provision/33619576>

Beyond Our Solar System

This topic addresses the following competency:

Competency 204.5.1: Astronomy

The graduate has a broad understanding of the basic concepts of astronomy.

Spectroscopy

Read the following chapter of the *Earth Science* textbook:

- [chapter 23 "Light, Astronomical Observations, and the Sun"](#)

View the following presentation on “Formation of the Three Types of Spectra:”

- [Formation of the Three Types of Spectra](#)

<https://lrps.wgu.edu/provision/33488806>

View the following presentation on “The Doppler Effect:”

- [The Doppler Effect](#)

<https://lrps.wgu.edu/provision/33488816>

Stars and Stellar Evolution

View the following presentation on “Diagram of the Sun’s Structure:”

- [Diagram of the Sun’s Structure](#)

<https://lrps.wgu.edu/provision/34451495>

[Read the following chapter of *Earth Science*:](#)

- [chapter 24 \(“Beyond Our Solar System”\)](#)

View the following presentation on “Hertzsprung-Russell Diagram:”

- [Hertzsprung-Russell Diagram](#)

<https://lrps.wgu.edu/provision/34579789>

View the following presentation on “Evolutionary Stages of Stars Having Various Masses:”

- [Evolutionary Stages of Stars Having Various Masses](#)



<https://lrps.wgu.edu/provision/34579797>

Spectroscopy and Stars Quiz

Complete the Geology Light Astronomical Observation Sun quiz:

- [Geology Light Astronomical Observation Sun Quiz](#)

<https://lrps.wgu.edu/provision/33619632>

Galaxies and the Universe

This topic addresses the following competency:

- **Competency 204.5.1: Astronomy**

The graduate has a broad understanding of the basic concepts of astronomy.

Galaxies and The Universe

Reading the following chapter in *Earth Science*:

- [chapter 24 \("Beyond Our Solar System"\)](#)

View the following presentation on "Spiral Galaxies:"

- [Spiral Galaxies](#)

<https://lrps.wgu.edu/provision/34579839>

Read and explore the following resource:

- [Cosmic Microwave Background](#)

Watch the following video:

- [Big Bang Cosmology](#)

View the following presentation on "Raisin Bread Analogy for an Expanding Universe:"

- [Raisin Bread Analogy for an Expanding Universe](#)

<https://lrps.wgu.edu/provision/33489110>

Galaxies and Universe Quiz

Complete the Geology Beyond Our Solar System quiz:

- [Geology Beyond Our Solar System Quiz](#)

<https://lrps.wgu.edu/provision/33619440>



Final Steps

Congratulations on completing the activities in this course! This course has prepared you to complete the assessments associated with this course. If you have not already been directed to complete the assessments, schedule and complete your assessments now.

Exam Requirements

In order to receive a "Pass" on your degree plan, you must pass General Science: Content Knowledge (5435) Praxis **Subject Assessment or the Middle School Science (5440) Praxis Subject Assessment** based upon the WGU cut score. Additionally, if the state in which you seek licensure also requires the Praxis exam, you must pass the exam based on that state's cut score before you will be admitted into Demonstration Teaching or allowed to graduate.

Note: It is possible to pass the exam based on either the WGU cut score or your state's cut score and still need to take it again in order to satisfy both cut scores.

Please review the following article in the WGU Student Handbook:

- [Article 2834 WGU Cut Scores for Assessments That Require Praxis Examinations](#)

Payment

WGU will pay for your first two attempts at the General Science: Content Knowledge (5435) Praxis **Subject Assessment or the Middle School Science (5440) Praxis Subject Assessment**. You will be responsible for paying third and subsequent attempts. WGU will not pay for extended or emergency registration, so be sure to plan ahead when scheduling the exam. Please see the following web page for detailed information on test and service fees:

- [Test and Service Fees](#)

Scheduling

The General Science: Content Knowledge (5435) Praxis **Subject Assessment or the Middle School Science (5440) Praxis Subject Assessment** is only offered as a computer-delivered test. Please visit the following web page for a list of available sites and testing windows.

- [Praxis Test Centers and Dates](#)

These tests are offered only during certain time frames and not all test centers are open on all test dates, so plan accordingly. Once you have selected a testing center and date, use the following directions to schedule your exam:

- [How to Schedule a Praxis Exam](#)

Note: You must schedule your Praxis exam through WGU in order to have WGU pay for the exam.



Follow the ETS guidelines on what to bring on exam day by accessing the following web page:

- [What to Bring](#)

Submit Your Score

You will need to submit your scores to WGU after completing this exam. Once you have submitted your passing score, you will receive a "Pass" on your Degree Plan for the assessment.

After completing an outside vendor assessment, follow the directions for submitting a score report here:

- [Following Outside Vendor Assessments](#)

Course Maintenance

WGU values your input! Please submit any feedback you have using the following form:

[Course Feedback](#)