Earth Science 5th Edition   
LESson Plan Overview

| Day | Section | ST Pages | TE Pages | Teacher Resources | Essential Questions Content Objectives |
| --- | --- | --- | --- | --- | --- |
| Unit 1: Introduction to Earth Science | | | | | |
| Chapter 1: The World of Earth Science (8 days)  Foundational Chapter | | | | | |
| 1 | 1A Why Study Earth Science? | 3–6 | 3–6 | Link: Tilly Smith and the Tsunami  Lab 1A: Feeding the World Through Earth Science—Modeling World Population Growth | EQ: How can we use earth science to fulfill God’s commands to the human race?  Objectives:  1A1 Explain why Christians do science.  1A2 Explain how earth science helps Christians declare God’s glory.  1A3 Defend the idea that earth science can play a role in God’s work of redemption. |
| 2 | Lab Day 1 | | | Lab 1A | |
| 3 | 1B A Christian Approach to Earth Science | 7–13 | 7–13 | Biblical Origins: The Gap Theory  Lab 1B: Finding the Standard Carrot—Inquiring into Standard Values | EQ: How does a biblical worldview affect earth science?  Objectives:  1B1 Define worldview.  1B2 Explain how one’s worldview is a key part of doing science.  1B3 Compare and contrast the secular and Christian worldviews.  1B4 Explain how models are important to science.  1B5 Define science. |
| 4 | Lab Day 2 | | | Lab 1B | |
| 5 | 1C Earth Science in Action | 14–20 | 14–20 | Case Study: Modeling the Solar System  Link: Tilly Smith and the Tsunami  Lab 1C: Insufficient Data—Investigating the Limits of Models | EQ: How does earth science work in the real world?  Objectives:  1C1 Explain how scientists do science.  1C2 Compare operational and historical science.  1C3 Identify various earth scientists and briefly describe their work. |
| 6 | Lab Day 3 | | | Lab 1C | |
| 7–8 | Review and Test Days | | | Chapter 1 Test | |
|  |  | | |  | |
| Chapter 2: Matter, Forces, and Energy (8 days)  Foundational Chapter | | | | | |
| 9 | 2A Matter | 24–31 | 24–31 | Info Box: Weight Versus Mass  Links: Google Earth Users Guide, Archimedes’s Principle  Demonstration: Boiling at Low Temperature  Google Earth Link: LHC  Lab 2A: Woody Data—Measuring Matter | EQ: What is matter and why is it important to earth science?  Objectives:  2A1 Show the impact of worldview on science.  2A2 Describe matter and the different forms it can take.  2A3 Describe how matter changes from one state to another.  2A4 Demonstrate three ways to measure matter. |
| 10 | Lab Day 1 | | | Lab 2A | |
| 11 | 2B Forces and Matter | 31–35 | 31–35 | Life Connection: Science in Microgravity  Link: Microgravity  Demonstrations: Newton’s Third Law, Forces at a Distance | EQ: How does matter interact to affect the world around us?  Objectives:  2B1 Classify forces and identify the various kinds of forces.  2B2 Investigate and describe how forces work in the universe.  2B3 Discuss the significance of the force of gravity. |
| 12 | 2C Energy and Matter | 36–41 | 36–41 | Links: Shockwaves and Sonic Booms, Why Is a Sonic Boom So Loud?  Lab 2B: Cooling Down—Understanding Temperature and Density | EQ: What is energy, and how does it affect matter?  Objectives:  2C1 Define work and energy.  2C2 Classify different types of energy.  2C3 Discuss the significance of the principle of the conservation of energy. |
| 13 | Lab Day 2 | | | Lab 2B | |
| 14 | 2D Composition of Matter | 41–48 | 41–48 | Case Study: The Building Blocks of Everything  Links: Elements Up Close, Interactive Periodic Table, Periodic Table Song, New Periodic Table Song | EQ: What makes up matter?  Objectives:  2D1 Describe the structure of atoms.  2D2 Recognize that protons determine an element’s identity.  2D3 Compare and contrast ions and atoms.  2D4 Distinguish between elements and compounds.  2D5 Show how a chemical formula is used to identify the elements in a molecule.  2D6 Describe the structure of matter at the atomic level.  2D7 State ways that we can know that different changes of matter have taken place. |
| 15–16 | Review and Test Days | | | Chapter 2 Test | |
| Chapter 3: Maps and Mapping (9 days)  Foundational Chapter | | | | | |
| 17 | 3A Why Do We Use Maps? | 52–60 | 52–60 | Info Box: GPS  Links: Ghost Map, Maps and Disease Control, Orienteering, Geocaching  Google Earth Link: International Date Line (IDL)  Lab 3A: Where Am I?—Determining Latitude | EQ: What features on most maps help us use them?  Objectives:  3A1 Show why maps are important for life.  3A2 Explain how mapmaking is modeling.  3A3 Discuss why maps need coordinate systems.  3A4 Describe how to find your location on a map.  3A5 Summarize standard map features. |
| 18 | Lab Day 1 | | | Lab 3A | |
| 19 | 3B Types of Maps | 60–65 | 60–65 | Demonstration: Map Distortion  Lab 3B: Measuring the Earth—Indirect Measurement of Earth’s Circumference | EQ: What must cartographers consider when designing a map?  Objectives:  3B1 Identify the three main types of map projections.  3B2 Briefly discuss the properties and uses of the common map projections.  3B3 Identify three standard types of maps.  3B4 Briefly discuss the use of contour lines in topographic maps.  3B5 Discuss the concept of a map theme.  3B6 Identify thematic maps. |
| 20 | Lab Day 2 | | | Lab 3B | |
| 21 | 3C Maps and GIS | 65–70 | 65–70 | Life Connection: GIS and Disaster Relief  Careers: Serving God as a Cartographer  Worldview Sleuthing: Driverless Cars  Links: GIS and Haiti Earthquake (2010), Drones and Dominion, Driverless Cars Rubric, Washington DC  Lab 3C: The Best Vacation—Learning Google Earth (2 days) | EQ: How can maps help people solve problems?  Objectives:  3C1 Define a geographic information system (GIS).  3C2 State the main uses for a GIS.  3C3 Identify sources of GIS data.  3C4 Explain how GIS maps are used to help people. |
| 22 | Lab Day 3 | | | Lab 3C (Day 1) | |
| 23 | Lab Day 4 | | | Lab 3C (Day 2) | |
| 24–25 | Review and Test Days | | | Chapter 3 Test | |
| Unit 2: The Restless Earth | | | | | |
| Chapter 4: Geology—The Earth Speaks (8 days)  Foundational Chapter | | | | | |
| 26 | 4A The Earth, a Special Place | 77–84 | 77–84 | Info Box: Our Moon: Unique in the Solar System  Links: Message from the Moon, Solar Heating Device Template  Demonstration: Earth’s Tilt  Lab 4A: Catching Some Rays—Modeling Solar Heating | EQ: What scientific evidence confirms that Earth was designed for life?  Objectives:  4A1 Explain why Earth is well-suited for life.  4A2 Show how Earth is unique by comparing it to other planets.  4A3 Explain how Earth’s design helps humans explore the heavens. |
| 27 | Lab Day 1 | | | Lab 4A | |
| 28 | 4B Geology, the Science | 85–89 | 85–89 | Case Study: Nicholaus Steno, Bishop of Geology  Demonstration: Uniformitarianism | EQ: How does our worldview affect our understanding of geology?  Objectives:  4B1 Summarize the history of geology.  4B2 Explain the dangers of viewing the earth as very old and as the product of natural processes.  4B3 Describe how geology is used. |
| 29 | 4C The Earth’s Structure | 90–92 | 90–92 | Link: Wave Speed demonstration  Lab 4B: Waves Through the Earth—Modeling Wave Motion in Solids | EQ: What is inside the earth and how do we know?  Objectives:  4C1 Explain how scientists study the interior of the earth.  4C2 Describe the different layers of the earth and their properties.  4C3 Sketch the earth’s interior, labeling its regions and layers. |
| 30 | Lab Day 2 | | | Lab 4B | |
| 31 | 4D The Earth’s Natural Resources | 93–96, 99 | 93–96, 99 | Life Connection: An “Out-of-Balance” World | EQ: How can we wisely use Earth’s resources to best glorify God and help others?  Objectives:  4D1 Identify natural resources.  4D2 Explain how to manage natural resources.  4D3 List factors that affect environmental quality.  4D4 Explain why Christians should be concerned about the environment.  4D5 Analyze the relationship between Earth’s resources and population. |
| 32–33 | Review and Test Days | | | Chapter 4 Test | |
| Chapter 5: The Changing Earth (7 days)  Foundational Chapter | | | | | |
| 34 | 5A Observing the Evidence | 101–8 | 101–8 | Case Study: The Arctic Quest to Understand Climate and Geology  Links: Continental Drift Activity, Glacier Speed  Google Earth Links: Tectonic Plates, Updated Tectonic Plates  Lab 5A: Going with the Flow—Inquiring into Density Currents | EQ: How does what we see tell us where Earth came from and how it has changed?  Objectives:  5A1 Explain why creating a story of Earth’s history depends on your worldview.  5A2 Analyze the evidence that the solar system gives us of its history of change.  5A3 Analyze the evidence that the earth gives us of its history of change. |
| 35 | Lab Day 1 | | | Lab 5A | |
| 36 | 5B The Old-Earth Story | 108–14 | 108–14 | Timeline of Earth (old-earth perspective)  Links: Nebular Hypothesis, Continental Drift, Geologic Time Scale, Ice Ages  Lab 5B: Where Do Those Dates Come From?—Understanding the Age of the Earth | EQ: What story of Earth’s history shows that it is millions of years old?  Objectives:  5B1 Describe the processes and sequence of the origin of the earth from an old-earth viewpoint.  5B2 Summarize the old-earth story of how the earth has changed during its history.  5B3 Evaluate the effectiveness of the old-earth story in accounting for the evidence. |
| 37 | Lab Day 2 | | | Lab 5B | |
| 38 | 5C The Young-Earth Story | 115–24 | 115–24 | Timeline of Earth (young-earth perspective)  Timeline of the Flood  Life Connection: The Flood, the Ark, and Species Today  Biblical Origins: The Day-Age Theory  Links: Answers in Genesis, Creation Ministries International, The Cubit, Dr. John Baumgardner, Determining the Ark Kinds | EQ: What story of Earth’s history shows that it is thousands of years old?  Objectives:  5C1 Describe the processes and sequence of the origin of the earth from a young-earth viewpoint.  5C2 Summarize the young-earth story of how the earth has changed during its history.  5C3 Evaluate the effectiveness of the Bible’s story in accounting for the evidence. |
| 39–40 | Review and Test Days | | | Chapter 5 Test | |
|  | | | | | |
| Chapter 6: Earthquakes (11 days)  Foundational Chapter | | | | | |
| 41 | 6A Tectonic Forces | 129–32 | 129–32 | Links: Earthquake 101, Quake Catcher Network  Demonstrations: Convection in the Earth, Ductility | EQ: What causes earthquakes?  Objectives:  6A1 Summarize how tectonic forces trigger earthquakes.  6A2 Show how certain kinds of tectonic processes are most likely the cause of earthquakes.  6A3 Identify the material properties of rocks that help cause earthquakes. |
| 42 | 6B Faults and Joints | 133–36 | 133–36 | Demonstrations: Strike and Dip, Types of Faults  Google Earth Link: San Andreas Fault | EQ: How do we classify faults?  Objectives:  6B1 Explain how joints, faults, and earthquakes are related.  6B2 Summarize how an earthquake happens. |
| 43 | 6C Earth Waves and Seismology | 136–41 | 136–41 | Careers: Serving God as a Seismologist  Links: Earthquake Montage, Real-Time Earthquakes, Making Waves, Locating the Epicenter, Tectonic Plates, Updated Tectonic Plates  Demonstrations: Waves, Epicenter and Focus  Google Earth Links: Mount St. Helens, Tectonic Plates, Updated Tectonic Plates, Real-Time Earthquakes  Lab 6A: Where Did It Start?—Locating an Earthquake’s Epicenter  Lab 6B: All Quiet?—Understanding Why Earthquakes Occur Where They Do | EQ: How do scientists collect earthquake data?  Objectives:  6C1 Describe how seismologists collect earthquake wave data.  6C2 Compare and contrast the types of seismic waves.  6C3 Explain how to find an earthquake’s epicenter. |
| 44 | Lab Day 1 | | | Lab 6A | |
| 45 | Lab Day 2 | | | Lab 6B | |
| 46 | 6D Effects of Earthquakes | 141–48, 151 | 141–48, 151 | Info Box: Upside Down Mountain  Life Connection: Quakes and Critters  Case Study: Earthquakes—The Big One!  Links: Earthquake Magnitude Liquifaction, Liquifaction Demonstration, Parkfield, CA Earthquake Experiment, Shake, Not Break Rubric, M7+ Earthquakes  Google Earth Links: Miyako City, Japan, Chief Mountain  Lab 6C: Shake Not Break—Designing Earthquake-Resistant Structures (3 days) | EQ: What are the effects of earthquakes on living things?  Objectives:  6D1 Describe how scientists rate earthquakes.  6D2 Explain why earthquakes can be so dangerous.  6D3 Evaluate the difficulty and benefits of predicting earthquakes. |
| 47 | Lab Day 3 | | | Lab 6C (Day 1) | |
| 48 | Lab Day 4 | | | Lab 6C (Day 2) | |
| 49 | Lab Day 5 | | | Lab 6C (Day 3) | |
| 50–51 | Review and Test Days | | | Chapter 6 Test | |
| Chapter 7: Mountains and Hills (6 days)  Key Chapter | | | | | |
| 52 | 7A: What Is a Mountain? | 153–58 | 153–58 | Info Box: Relief Maps  Case Study: Brad Washburn: Adventurer, Cartographer  Links: How Tall is Mount Everest?, Notable Mountains of the World, USGS Map Store  Demonstration: Isostasy  Google Earth Links: Notable Mountains of the World, Mount Whitney, Denali, Mount Everest, Mauna Kea  Lab 7A: How High?—Modeling Indirect Measurement of Mountains | EQ: What factors determine the height of a mountain?  Objectives:  7A1 Discuss the relation of topography to the principle of isostasy.  7A2 Summarize processes that contribute to orogeny.  7A3 Identify and describe various kinds of mountain and hill landforms.  7A4 Differentiate between elevation and actual height. |
| 53 | 7B: Tectonic Mountains | 158–64 | 158–64 | Demonstrations: Geologic Folding, Domes and Basins  Google Earth Links: Tectonic Plates, Updated Tectonic Plates, Lake Tanganyika, Lake Victoria, Laguna Verde | EQ: How do mountains form?  Objectives:  7B1 Relate tectonic forces to orogeny.  7B2 Identify various convergent, divergent, and volcanic mountain landforms.  7B3 Identify various uplift and subsidence landforms. |
| 54 | 7C: Non-Tectonic Hills and Mountains | 165–70 | 165–70 | Life Connection: “In the Zone” on Mount Kilimanjaro  Google Earth Links: Mount Kilimanjaro, Kilimanjaro Climate Zones, Mount Kilimanjaro Climbing Routes, Matterhorn, Mount Etna  Lab 7B: Staying on Top of It—Understanding Topographic Maps | EQ: What other ways can mountains form?  Objectives:  7C1 Explain in basic terms the processes of erosion and deposition.  7C2 Describe the various processes that produce erosional mountains.  7C3 Describe related tectonic processes that contribute to some residual landforms.  7C4 Discuss the major processes that created depositional mountains. |
| 55 | Lab Day | | | Lab 7A or 7B | |
| 56–57 | Review and Test Days | | | Chapter 7 Test | |
| Chapter 8: Volcanoes and Volcanism (6 days)  Key Chapter | | | | | |
| 58 | 8A: Fire Mountains | 175–84 | 175–84 | Life Connection: They Can Take the Heat  Links: Eyjafjallajökull Eruption, Notable Volcanoes of the World, Four Types of Lava, Pillow Lava, Pyroclastic Flow  Demonstration: Insulation  Google Earth Links: Eyjafjallajökull, Tectonic Plates, Global Volcano map, Updated Tectonic Plates  Lab 8A: Hot Spots—Understanding Why Volcanoes Are Located Where They Are | EQ: Why should we study volcanoes?  Objectives:  8A1 Explain how earth science helps reduce the risks of natural hazards like volcanoes.  8A2 Describe the structure of a volcano.  8A3 List and describe the main kinds of volcanic emissions.  8A4 Associate the locations of extrusive igneous features around the world with tectonically active regions.  8A5 Infer from the global distribution of volcanoes the amount of volcano activity during the Genesis Flood. |
| 59 | 8B: Classifying Volcanoes | 184–91 | 184–91 | Worldview Sleuthing: Mount St. Helens  Info Box: Mount Tambora: The Most Powerful Eruption in History  Careers: Serving God as a Volcanologist  Links: Mount St. Helens Webquest Rubric, Pyroclastic Flow  Demonstration: Profiles of a Volcano  Google Earth Links: Mount Rainier, Mount Tambora, Mount Unzen  Lab 8B: Volcanic Visits—Examining Volcanic Eruptions | EQ: What are the different types of volcanoes?  Objectives:  8B1 Identify and categorize volcanoes by their shape and composition.  8B2 Infer the activity of a volcano on the basis of its eruption history and seismic activity.  8B3 Analyze the definition of volcanic activity from both young-earth and old-earth viewpoints.  8B4 Classify the destructiveness of a volcanic eruption on the basis of the Volcanic Explosivity Index. |
| 60 | Lab Day | | | Lab 8A or Lab 8B | |
| 61 | 8C: Intrusive Volcanism | 192–97 | 192–97 | Link: Old Faithful Webcam  Demonstration: Pluton Formation  Google Earth Links: Grand Prismatic Spring, Krakatoa | EQ: How does intrusive volcanism differ from extrusive volcanism?  Objectives:  8C1 Compare intrusive volcanism with extrusive volcanism.  8C2 Describe various intrusive igneous formations and how they formed.  8C3 Define the geothermal gradient and describe how it varies with depth into the earth.  8C4 Discuss hydrothermal processes and identify volcanic features associated with heated groundwater.  8C5 Describe how energy can be extracted from geothermal sources. |
| 62–63 | Review and Test Days | | | Chapter 8 Test | |
| Unit 3: Earth’s Rocky Materials | | | | | |
| Chapter 9: Minerals and Ores (7 days)  Foundational Chapter | | | | | |
| 64 | 9A Describing Minerals | 203–5 | 203–5 | Lab 9A: Crafting a Crystal—Understanding Crystal Growth | EQ: How do I know whether a substance is a mineral?  Objectives:  9A1 Relate the study and use of minerals to exercising biblical dominion.  9A2 Determine whether a substance is a mineral.  9A3 Classify natural materials as either native or compound minerals, or mixtures of these. |
| 65 | Lab Day 1 | | | Lab 9A | |
| 66 | 9B Identifying Minerals | 205–11 | 205–11 | Infographic: Minerals and Their Crystals  Links: Mineral Identification Gizmo, Flame Test, Mineral and Rock Identification Project, Mineral Identification Key (1), Mineral Identification Key (2)  Demonstrations: Cleavage and Fracture, Flame Test  Lab 9B: Unmasking Mysterious Minerals—Identifying Crystals | EQ: How do mineralogists identify minerals?  Objectives:  9B1 Define mineralogy and explain what mineralogists do.  9B2 Describe characteristics used for mineral identification. |
| 67 | Lab Day 2 | | | Lab 9B | |
| 68 | 9C Minerals as Resources | 212–19 | 212–19 | Info Box: Trapped Underground  Life Connection: Mud Pies for Macaws  Demonstrations: Placer Deposits, Sulfur’s Physical Properties  Google Earth Links: Statue of Liberty, Argyle Diamond mine, Copiapó Mine, Jefferson Memorial | EQ: How do we use minerals?  Objectives:  9C1 Evaluate the dominion uses of minerals in view of their practicality and beauty.  9C2 Discuss where native minerals are found.  9C3 Describe the key identifying properties of native minerals.  9C4 Give specific examples of the usefulness of minerals.  9C5 Differentiate between native and compound minerals.  9C6 Weigh the benefits and adverse effects of mining for minerals. |
| 69–70 | Review and Test Days | | | Chapter 9 Test | |
| Chapter 10: Rocks (9 days)  Foundational Chapter | | | | | |
| 71 | 10A Classifying Rocks | 223–25 | 223–25 | Life Connection: Rock Sweet Rock  Links: USGS Volcanoes Hazards Program: Kilauea, Kilauea Lava Flow  Google Earth Link: Kilauea | EQ: How do the types of rock differ?  Objectives:  10A1 Define rocks.  10A1 Classify types of rocks on the basis of how they formed.  10A1 Identify properties of rocks used to classify them. |
| 72 | 10B Igneous Rocks | 226–29 | 226–29 | Links: Mineral and Rock Identification Project, Rock Identification Key, Mount Rushmore  Demonstration: Floating Rock | EQ: How do intrusive and extrusive igneous rocks differ?  Objectives:  10B1 Evaluate the theories of origin of igneous rocks.  10B2 Classify igneous rocks by texture and magma types.  10B3 Identify common intrusive and extrusive igneous rocks.  10B4 Explain why igneous rocks have been used by humans throughout history. |
| 73 | 10C Sedimentary Rocks | 230–36 | 230–36 | Careers: Serving God as a Sedimentologist  Link: The Flood and Chalk Deposits  Demonstration: Artificial Sandstone  Google Earth Link: Seven Sisters Chalk Cliffs  Lab 10A: That Settles It—Inquiring into Sedimentation | EQ: How does eroded material become sedimentary rock?  Objectives:  10C1 Evaluate the theories of origin of sedimentary rocks.  10C2 Describe the processes by which clastic and nonclastic sedimentary rocks formed.  10C3 Correctly classify sedimentary rocks.  10C4 Discuss common uses of sedimentary rocks. |
| 74 | Lab Day 1 | | | Lab 10A | |
| 75 | 10D Metamorphic Rocks | 237–41 | 237–41 | Info Box: Hydrothermal Fluids  Links: Rock Identification Key, Rock Identification Gizmo  Lab 10B: Rock-Solid Science—Understanding Rock Characteristics | EQ: How can rocks change?  Objectives:  10D1 Differentiate between metamorphic rocks and other kinds of source rocks.  10D2 Identify the important agents of metamorphism.  10D3 Describe important processes of metamorphism.  10D4 Correctly classify metamorphic rocks.  10D5 Explain why metamorphic rocks have been used throughout history. |
| 76 | Lab Day 2 | | | Lab 10B | |
| 77 | 10E The Rock Cycle | 242–44, 247 | 242–44, 247 | Case Study: Rocks and the Age of the Earth | EQ: Does the rock cycle naturally recycle rocks?  Objectives:  10E1 Explain the key features of the old-earth rock cycle hypothesis.  10E2 Evaluate the feasibility of the rock cycle from within a young-earth view of Earth’s history.  10E3 Refute the assertion that the earth was created to reuse rock natural resources. |
| 78–79 | Review and Test Days | | | Chapter 10 Test | |
| Chapter 11: Fossils (7 days)  Foundational Chapter | | | | | |
| 80 | 11A Fossilization | 249–57 | 249–57 | Infographics: Kinds of Fossils, A Fossil Sampler  Biblical Origins: Progressive Creationism  Worldview Sleuthing: Ötzi  Links: La Brea Tar Pit, Fossilization, Champlain Beluga, iDINO II Project, Ötzi Webquest Rubric  11A: Encrusted Critters—Investigating Fossilization | EQ: Where do fossils come from?  Objectives:  11A1 Explain what fossils are and how they form.  11A2 Evaluate whether an object is a fossil, a trace fossil, or a non-fossil.  11A3 Analyze the origins of fossils that we find today. |
| 81 | Lab Day 1 | | | Lab 11A | |
| 82 | 11B Paleontology | 258–65 | 258–65 | Info Boxes: What Happened to the Dinosaurs?, Trilobites  Links: Chicxulub Impact, Dead Sea Scrolls  Lab 11B: How Old Is It?—Investigating Radiocarbon Dating | EQ: What can we learn from fossils?  Objectives:  11B1 Summarize how to classify and name living and extinct organisms.  11B2 Identify the factors that lead to the extinction of an organism.  11B3 Evaluate efforts to interpret the fossil record in light of one’s worldview.  11B4 Analyze and evaluate the explanations for the evidence of mass extinctions in the fossil record. |
| 83 | Lab Day 2 | | | Lab 11B | |
| 84 | 11C Fossil Fuels | 265–73 | 265–73 | Life Connection: Deep Dark Secrets  Links: Coal Deposits Map, Deepwater Horizon | EQ: Where do fossil fuels come from?  Objectives:  11C1 Describe fossil fuels and how we use them.  11C2 Evaluate different origin theories for coal, petroleum, and natural gas.  11C3 Evaluate the risks and benefits of using fossil fuels. |
| 85–86 | Review and Test Days | | | Chapter 11 Test | |
|  |  | | |  | |
| Chapter 12: Weathering, Erosion, and Soils (6 days)  Key Chapter | | | | | |
| 87 | 12A Weathering | 277–80 | 277–80 | Case Study: What Happened to George Washington?  Links: USGS: Mount St. Helens, Mount St. Helens Eruption  Demonstration: Frost Wedging  Google Earth Link: Crowfoot Mountain  Lab 12A: All Worn-Out—Investigating Weathering | EQ: What makes rocks break down?  Objectives:  12A1 Explain how rock weathers.  12A2 Recognize the effects of weathering.  12A3 Analyze what determines the rate of weathering. |
| 88 | 12B Erosion and Deposition | 281–92 | 281–92 | Info Boxes: Glaciers and Climate Change, Varves  Links: Grand Canyon Video Series, Sedimentation, Glacier Calving, Glacier Speed  Google Earth Links: Oso, Washington Landslide, Grand Canyon  Lab 12B: Glacier Trek—Understanding Characteristics of Glaciers (2 days) | EQ: What forces act in the processes of erosion and deposition?  Objectives:  12B1 Relate stream erosion and deposition to stream speed.  12B2 Explain the process of wind erosion and deposition.  12B3 Describe the main processes that result in glacial erosion and deposition.  12B4 Recognize the effects of erosion.  12B5 Identify erosion and depositional features on maps. |
| 89 | Lab Day 1 | | | Lab 12A or Lab 12B | |
| 90 | 12C Soil | 293–98, 301 | 293–98, 301 | Life Connection: Living Soil  Info Box: Controlling Erosion  Careers: Serving God as a Pedologist  Links: Mount St. Helens Eruption, USDA’s National Resources Conservation Service  Google Earth Links: Mount St. Helens, Chapter 12 Map Exercises | EQ: How does soil form?  Objectives:  12C1 Describe how soil forms, including its horizons.  12C2 Analyze how different factors affect soil.  12C3 Evaluate ways for using and conserving soil. |
| 91–92 | Review and Test Days | | | Chapter 12 Test | |

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| Unit 4: The Water World | | | | | |
| Chapter 13: Oceans and Seas (7 days)  Foundational Chapter | | | | | |
| 93 | 13A Ocean Basins | 305–16 | 305–16 | Life Connection: Swimming Through a Rainforest  Links: Water Crisis, Geoid, Turbidity Current, Coral Bleaching, Virtual Coral Reef Dive  Google Earth Link: Challenger Deep | EQ: What does the topography of the oceans look like?  Objectives:  13A1 Explain the reasons that the oceans are essential to life and some of the ways that we use them.  13A2 Evaluate theories that account for the origin of the oceans.  13A3 List the factors that determine mean sea level and describe how sea level varies around the globe.  13A4 Describe the general ocean basin topography from the shore to the abyssal plains.  13A5 Describe various kinds of coral reefs and atolls, and their origin, geologic significance, and impact on aquatic life. |
| 94 | 13B Seawater | 317–23 | 317–23 | Worldview Sleuthing: Drinkable Water from Seawater  Link: Drinkable Water from Seawater Rubric  Demonstration: Salinity of Seawater  Lab 13A: Weighty Waters—Investigating Density  Lab 13B: Low Salt—Desalination by Freezing | EQ: How does seawater differ from fresh water?  Objectives:  13B1 Evaluate different Flood theories that could account for the saltiness of the oceans.  13B2 Identify the main chemicals that contribute to ocean salinity.  13B3 List the factors affecting salinity.  13B4 Explain how salinity affects important physical properties of seawater. |
| 95 | Lab Day 1 | | | Lab 13A | |
| 96 | 13C Ocean Environments | 323–27 | 323–27 | Info Box: Marine Snow  Link: Ocean Zones  Google Earth Link: Chapter 13 Map Exercises | EQ: How does the ocean environment vary from place to place?  Objectives:  13C1 Compare the different biological zones in the ocean.  13C2 Summarize the marine carbon and nitrogen cycles. |
| 97 | Lab Day 2 | | | Lab 13B | |
| 98–99 | Review and Test Days | | | Chapter 13 Test | |
|  |  | | |  | |
| Chapter 14: Ocean Motions (7 days)  Foundational Chapter | | | | | |
| 100 | 14A Tides | 331–36 | 331–36 | Links: Global Currents, Tides, Hopewell Rocks, Hall’s Harbour, Tidal Power Generation, Swansea Bay Tidal Lagoon | EQ: What causes tides and how can we use them?  Objectives:  14A1 Compare tides with other ocean motions.  14A2 Analyze the forces that create and affect tides.  14A3 Evaluate the best uses of tides for generating electricity. |
| 101 | 14B Currents | 337, 338–45 | 337, 338–45 | Life Connection: Ocean Migrations  Info Box: The Coriolis Effect  Worldview Sleuthing: Great Pacific Garbage Patch  Links: Global Current Mapper, Coriolis Effect, Great Pacific Garbage Patch Video, Great Pacific Garbage Patch Rubric, Salinity Conversion Graph  Demonstrations: Currents, Upwelling and Downwelling, Density Currents  Lab 14A: Too Salty?—Investigating Salinity  Lab 14B: Current Events—Modeling Thermohaline Currents | EQ: What causes and affects currents?  Objectives:  14B1 Contrast currents with other ocean motions.  14B2 Analyze the forces that create and affect currents.  14B3 Evaluate the effect of currents on weather and life. |
| 102 | Lab Day 1 | | | Lab 14A | |
| 103 | 14C Waves | 345–51 | 345–51 | Info Box: Rip Currents: Swimmers Beware  Links: Large Waves, Cruise Ship in Distress  Demonstration: Waves  Google Earth Links: Cape Henlopen (spit), Sea of Azov (bay barrier), Wood End (hook), North Atlantic Currents, Pacific Garbage Patch, Pacific Ocean Currents | EQ: Where do waves come from?  Objectives:  14C1 Define wave terminology.  14C2 Analyze the forces that create and affect waves.  14C3 Predict what kind of landforms will be created under specific sets of wave and land conditions. |
| 104 | Lab Day 2 | | | Lab 14B | |
| 105–6 | Review and Test Days | | | Chapter 14 Test | |
|  |  | | |  | |
| Chapter 15: Ocean Exploration (6 days)  Enrichment Chapter | | | | | |
| 107 | 15A The History of Ocean Exploration | 356–59 | 356–59 | Case Study: The $6,000,000 Clock  Links: Longitude Act, Longitude Found: John Harrison, Notable Explorations, Challenger Expedition Report  Google Earth Link: Isles of Scilly | EQ: How have we studied the oceans in the past?  Objectives:  15A1 Summarize the history of key advances in our knowledge of the world’s oceans.  15A2 Identify the motivations behind these key advances. |
| 108 | 15B Oceanography in Action | 360–67 | 360–67 | Careers: Serving God as an Oceanographer  Life Connection: A Farm on Your Arms  Links: Secchi Disk Simulator, Box Core Sampling, Yeti Crab Paper, Sonar  Lab 15A: Taking a Bath—Examining Ocean Topography | EQ: How do we explore the ocean today?  Objectives:  15B1 Compare the methods we use to study the oceans.  15B2 Evaluate how technology improves ocean exploration. |
| 109 | 15C Entering an Alien World | 368–75 | 368–75 | Info Boxes: Diving Technology, Sea Habitats  Links: Jacques Cousteau, Aquarius, Underwater Laboratory, Challenger Deep, Notable Submersibles  Demonstration: Cartesian Diver  Google Earth Link: Challenger Deep  Lab 15B: Dive, Dive!—Investigating Archimedes’s Principle | EQ: Why is it so difficult to study the ocean?  Objectives:  15C1 Summarize the history of  deep-sea diving.  15C2 Explain the progress in ocean exploration vehicles.  15C3 Evaluate the risks and benefits of ocean exploration. |
| 110 | Lab Day | | | Lab 15A or Lab 15B | |
| 111–12 | Review and Test Days | | | Chapter 15 Test | |
| Chapter 16: Surface Waters (5 days)  Key Chapter | | | | | |
| 113 | 16A Streams | 379–86, 387 | 379–86, 387 | Case Study: The Influence of Rivers on US History  Links: Victoria Falls, Notable Rivers of the World, Three Gorges Dam video, Three Gorges Dam Article, Niagara Falls, Triple Divide Points in the Lower 48, Angel Falls, Three Gorges Ship Lift, Three Gorges Ship Lift Animation  Google Earth Links: Victoria Falls, Three Gorges Dam, Divides | EQ: What are the characteristics of the different types of streams?  Objectives:  16A1 Compare the different kinds of streams.  16A2 Sketch a stream from source to mouth and label its parts.  16A3 Analyze ways to wisely use streams. |
| 114 | 16B Lakes and Ponds | 386–95 | 386–95 | Info Box: Race Cars and Salt Flats  Life Connection: Bogs, Bays, and Bloodthirsty Plants  Google Earth Link: Chapter 16 Map Exercises  Lab 16A: Surface Impressions—Exploring Surface Water  Lab 16B: Being Too Green?—Investigating Eutrophication | EQ: How do lakes change over time?  Objectives:  16B1 Relate a lake’s chemical properties and anatomy to its geologic setting and elevation.  16B2 Categorize lakes by their properties.  16B3 Analyze different views of the origins of lakes.  16B4 Summarize the typical life phases of a lake. |
| 115 | Lab Day | | | Lab 16A or Lab 16B | |
| 116–17 | Review and Test Days | | | Chapter 16 Test | |
| Chapter 17: Groundwater (8 days)  Key Chapter | | | | | |
| 118 | 17A Underground Reservoirs | 399–404, 405 | 399–404, 405 | Biblical Origins: Analogous Days Theory  Info Box: Depleted Aquifers  Links: Jesus Wells, Jesus Well Installation, Water Cycle (NSF), Water Cycle (NASA)  Demonstrations: The Water Table, Capillary Action, Porosity  Lab 17A: Perking Down—Modeling Groundwater Storage | EQ: How is water stored in the ground?  Objectives:  17A1 Create a chart or graph that compares the major segments of the earth’s water inventory.  17A2 Describe the water cycle.  17A3 Express the relationships between the terms porous, nonporous, permeable, and impermeable when used to describe rocks.  17A4 Discuss the geologic features, storage, and movement of groundwater applied to its availability as drinking water. |
| 119 | 17B Groundwater Chemistry | 406–8 | 406–8 | Link: Water and Solutions  Demonstrations: Universal Solvent, Mineral Deposits in Water  Lab 17B: Taking the Waters—Investigating Water Quality | EQ: Why is tap water not pure water?  Objectives:  17B1 Relate the dissolving power of water to its physical and chemical properties.  17B2 Explain how the amounts and kinds of dissolved minerals in drinking water affect its hardness and usefulness.  17B3 Describe different methods for softening hard water. |
| 120 | 17C Water as a Resource | 408–13 | 408–13 | Links: Center Pivot Irrigation, Water Conservation, Disposal of Unused Medicine, Water Treatment, Well Data  Lab 17C: Follow the Flow—Inquiring into Groundwater Pollution (2 days) | EQ: How can we wisely use water?  Objectives:  17C1 Explain how we can use and conserve drinking water.  17C2 Identify the ways that drinking water can become polluted.  17C3 Relate the importance of drinking water and sewage treatment to modern, healthy living. |
| 121 | Lab Day 1 | | | Lab 17A or Lab 17C (Day 1) | |
| 122 | Lab Day 2 | | | Lab 17B or Lab 17C (Day 2) | |
| 123 | 17D Groundwater Landforms | 414–22, 425 | 414–22, 425 | Life Connection: Curious Cave Critters  Careers: Serving God as a Speleologist  Case Study: White Nose Syndrome  Links: Notable Caves of the World, various cave links, White Nose Syndrome  Google Earth Links: Blue Grotto, Dead Sea Caves, Carlsbad Caverns, Craters of the Moon, Lava Beds National Monument | EQ: What conditions are required to form caves?  Objectives:  17D1 Evaluate old- and young-earth models for the origin of solution caves.  17D2 Explain where cave features come from.  17D3 Distinguish between a spelunker, a caver, and a speleologist.  17D4 Describe some features of karst topography. |
| 124–25 | Review and Test Days | | | Chapter 17 Test | |
| Unit 5: The Atmosphere | | | | | |
| Chapter 18: Earth’s Atmosphere (6 days)  Foundational Chapter | | | | | |
| 126 | 18A What Is the Atmosphere? | 429–39 | 429–39 | Case Study: Skydiving from Space  Links: Urey-Miller Experiment, Urey-Miller Experiment Analysis, Baumgartner’s Space Jump, Carbon Cycle, Nitrogen Cycle  Demonstration: Ammonia  Lab 18A: Weighty Matters—Understanding Barometric Pressure | EQ: How does the atmosphere change with elevation?  Objectives:  18A1 Describe how people can affect the atmosphere.  18A2 Identify evidence of design in the atmosphere.  18A3 Sketch the atmosphere’s composition, temperature, and structure.  18A4 Trace the flow of carbon and nitrogen in the atmosphere. |
| 127 | 18B Special Zones in the Atmosphere | 439–44 | 439–44 | Info Boxes: The Ozone Hole, Larry Vardiman, Atmosphere Scientist  Links: Monitoring the Ozone Hole, Ionosphere, Magnetosphere, Northern Lights Video, Northern Lights | EQ: How do special layers of the atmosphere protect life on Earth?  Objectives:  18B1 Relate special zones of the atmosphere to the other layers.  18B2 Explain how the special zones in the atmosphere are evidence of God’s good design. |
| 128 | 18C Energy in the Atmosphere | 445–49 | 445–49 | Life Connection: UV Light and Life  Links: Paper Ruler Template, Mount Washington Observatory  Demonstration: Visible Light Spectrum  Google Earth Link: Mount Washington Observatory  Lab 18B: Warming Up—Investigating Solar Heating | EQ: How does energy from the sun affect the atmosphere?  Objectives:  18C1 Sketch the flow of energy in the atmosphere.  18C2 Compare radiation, conduction, and convection. |
| 129 | Lab Day | | | Lab 18A or 18B | |
| 130–31 | Review and Test Days | | | Chapter 18 Test | |
| Chapter 19: Weather (7 days)  Foundational Chapter | | | | | |
| 132 | 19A What Is Weather? | 453–57 | 453–57 | Links: Wind Power, Time Lapse Weather, Cloud Photography Project, Wind Power Capacity  Demonstration: Air Pressure | EQ: How do scientists collect weather data?  Objectives:  19A1 Evaluate the risks and benefits of wind power.  19A2 Describe the weather data that meteorologists collect.  19A3 Compare the different aspects of weather with one another. |
| 133 | 19B Winds | 458–63 | 458–63 | Life Connection: Winds and Migration  Links: Bar-Headed Goose, Anemometer Template  Lab 19A: On the Wings of the Wind—Understanding Wind Speed Measurement | EQ: What determines the speed and direction of the wind?  Objectives:  19B1 Explain what factors affect winds.  19B2 Locate and name the major global wind belts.  19B3 Identify sources of local winds. |
| 134 | Lab Day 1 | | | Lab 19A | |
| 135 | 19C Clouds and Precipitation | 464–70 | 464–70 | Infographic: Cloud Types  Info Box: Mount Washington: Home of the World’s Worst Weather?  Links: Cloud Classification Guide, New Cloud Types, Snowflake Bentley, Snowflake Bentley (ICR), SEM Snowflake, World Wind Resources, Mount Washington Observatory  Demonstrations: Dew Point, Cloud Formation, Dirty Rain  Google Earth Link: Mount Washington Observatory  Lab 19B: Psyched Out—Understanding Relative Humidity Measurement | EQ: How do clouds play a part in weather?  Objectives:  19C1 Explain how clouds form.  19C2 Relate clouds, air temperature, and humidity to precipitation.  19C3 Compare the different forms of precipitation.  19C4 Classify clouds by altitude, shape, and potential for precipitation. |
| 136 | Lab Day 2 | | | Lab 19B | |
| 137–38 | Review and Test Days | | | Chapter 19 Test | |
|  |  | | |  | |
| Chapter 20: Storms and Weather Prediction (9 days)  Foundational Chapter | | | | | |
| 139 | 20A Air Masses and Fronts | 475–80 | 475–80 | Links: Storm Prediction Center (SPC), Weather Fronts, Rain Shadow Effect  Demonstration: Convection | EQ: What creates weather?  Objectives:  20A1 Explain how air masses move with weather.  20A2 Identify air masses by their source regions.  20A3 Connect weather to the interaction of two or more air masses.  20A4 Describe processes that produce precipitation. |
| 140 | 20B Severe Weather  Day 1 | 481–85 | 481–85 | Info Box: Doppler Radar  Links: Doppler Effect, Doppler Effect Applet, Doppler Radar, Thunderstorm Formation, Lightning, Lightning Video, World Lightning Map  Demonstration: Lightning | EQ: How do severe storms form?  Objectives:  20B1 Classify storms and explain how they form.  20B2 Describe the major hazards of each kind of storm.  20B3 Identify the key actions to take to remain safe in each kind of storm. |
| 141 | 20B Severe weather  Day 2 | 486–95 | 486–95 | Info Box: Hurricane Hunters  Life Connection: What Happens to Animals During Hurricanes?  Worldview Sleuthing: Severe Weather Response  Links: Tornado, Tornado Video, Storm Chaser, Last Days of a Storm Chaser, Tornado History Database, Naming Hurricanes, Hurricane Hunters, Hurricane Hunter Video 1, Hurricane Hunter Video 2, Severe Weather Response Rubric  Lab 20A: Tornado Chasing—Understanding Tornadoes  Lab 20B: Hurricane Hunting—Understanding Hurricanes |  |
| 142 | Lab Day 1 | | | Lab 20A | |
| 143 | Lab Day 2 | | | Lab 20B | |
| 144 | 20C Weather Forecasts | 495–99 | 495–99 | Info Box: National Weather Service  Links: Station Model Exercise, Weather Prediction Center (WPC), Daily Synoptic Weather Map, NEXRAD, National Weather Service (NWS)  Demonstration: Weather Map Symbols  Lab 20C: Rain or Shine?—Forecasting Weather | EQ: Why is predicting the weather so difficult?  Objectives:  20C1 Describe weather station models.  20C2 Explain how weather data is used to construct weather maps.  20C3 Evaluate the probable accuracy of a weather forecast. |
| 145 | Lab Day 3 | | | Lab 20C | |
| 146–47 | Review and Test Days | | | Chapter 20 Test | |
| Chapter 21: Climate and Climate Change (6 days)  Key Chapter | | | | | |
| 148 | 21A What Is Climate? | 503–9 | 503–9 | Info Box: The Canopy Theory  Links: Global Climate Change (NASA), NOAA Climate, National Park Service  Demonstration: The Effects of Ray Angle on Heating, The Land of the Midnight Sun  Google Earth Link: Mount Kilimanjaro | EQ: What is climate, and what factors affect it?  Objectives:  21A1 Contrast climate with weather.  21A2 Analyze how different factors may affect climate. |
| 149 | 21B Climate Zones | 509, 510, 511–14 | 509, 510, 511–14 | Biblical Origins: The Framework Hypothesis  Careers: Serving God as a Climatologist  Infographic: Into the Zones  Link: Lonnie Thompson  Google Earth Links: Mount Kilimanjaro, Mount Kilimanjaro Climate Zones | EQ: How do scientists classify climates?  Objectives:  21B1 Identify six major kinds of climates.  21B2 Give examples of the different kinds of climates. |
| 150 | 21C Climate Change | 515–25 | 515–25 | Info Box: The Melt Zone  Case Study: CO2 in the Atmosphere  Life Connection: Are Polar Bears on Thin Ice?  Links: Calving Glacier, Arctic Sea Ice News, Arctic Sea Ice Minimum, El Niño and La Niña, American Thinker, Water Vapor, various web sites for Lab 21B  Google Earth Links: Ross Ice Shelf, Mount Pinatubo, Biosphere 2  Lab 21A: Models That Mislead—Investigating the Limits of Models (2 days)  Lab 21B: Data Dilemma—Inquiring into Climate Change | EQ: How does climate change relate to a Christian worldview?  Objectives:  21C1 Analyze potential causes for climate change.  21C2 Critique worldview assumptions behind global climate models.  21C3 Evaluate current fears of climate change.  21C4 Formulate a Christian perspective of climate change. |
| 151 | Lab Day | | | Lab 21A or Lab 21B | |
| 152–53 | Review and Test Days | | | Chapter 21 Test | |
| Unit 6: The Heavens | | | | | |
| Chapter 22: The Sun, Moon, and Earth System (7 days)  Foundational Chapter | | | | | |
| 154 | 22A The Sun | 531–39 | 531–39 | Infographic: Up Close with the Sun  Links: Stonehenge, Scale of the Sun and Earth, Mixing Light, The Sun’s Atmosphere, Sunspots, Solar Flare, CME, Equatorial Sundial Spreadsheet, Magnetic Declination  Demonstrations: Visible Light Spectrum, Mixing Light, Bright-Line Spectra  Google Earth Link: Stonehenge  Lab 22A: The Giant Clock—Understanding Sundials | EQ: How does the sun change, affecting life on Earth?  Objectives:  22A1 Describe the sun’s structure, activity, and energy.  22A2 Summarize the sun’s influence on Earth. |
| 155 | Lab Day 1 | | | Lab 22A | |
| 156 | 22B The Moon | 539–44 | 539–44 | Info Box: Hidden Figures  Links: Lunar Origins, Moon Dust and a Young Moon, Lunar Rover | EQ: What is the structure and surface of the moon like?  Objectives:  22B1 Sketch the moon’s structure.  22B2 Describe the moon’s surface. |
| 157 | 22C The Sun, Moon, and Earth as a System | 545–54 | 545–54 | Links: Lunar Libration, Phases of the Moon, Calendars, Seasons, Solar Eclipse, Lunar Eclipse, Sun and Moon Data  Demonstrations: The Moon’s Phases, Seasons  Lab 22B: Mastering the Moon—Modeling Lunar Phases | EQ: How do the sun, moon, and earth interact?  Objectives:  22C1 Describe how sun and earth interactions cause seasons.  22C2 Identify and explain the moon’s phases.  22C3 Analyze how sun, moon, and earth interactions create eclipses.  22C4 Differentiate between ocean tides and earth tides. |
| 158 | Lab Day 2 | | | Lab 22B | |
| 159–60 | Review and Test Days | | | Chapter 22 Test | |
| Chapter 23: Our Solar System (7 days)  Foundational Chapter | | | | | |
| 161 | 23A Modeling the Solar System | 560–66 | 560–66 | Links: New Horizons (NASA), New Horizons, Retrograde Motion Video, Retrograde Motion (NASA)  Lab 23A: Elliptical Excursions—The Ellipse and Planetary Motion | EQ: How do we know that the sun is the center of our solar system?  Objectives:  23A1 Analyze models of the solar system.  23A2 Discuss the cultural significance of the adoption of the heliocentric system.  23A3 Describe the properties of planetary orbits. |
| 162 | Lab Day 1 | | | Lab 23A | |
| 163 | 23B The Planets | 567–77 | 567–77 | Life Connection: Just Add Water?  Case Study: Journey to Mars  Links: Scale of the Solar System, Mission to Mercury, Journey to Mars, Juno Mission to Jupiter, Cassini Mission to Saturn  Lab 23B: Running Backward—Understanding Retrograde Motion | EQ: How do the planets in our solar system compare with each other?  Objectives:  23B1 Categorize objects in the solar system.  23B2 Describe the position, appearance, size, composition, motion, and special features of the planets in our solar system.  23B3 Contrast other planets in the solar system with Earth. |
| 164 | Lab Day 2 | | | Lab 23B | |
| 165 | 23C Non-planetary Objects | 577–84 | 577–84 | Info Box: Asteroid Strike!  Careers: Serving God as an Astrogeologist  Links: Asteroid Names, Asteroid Florence “Near Miss,” Exploring Comets, Tunguska Event | EQ: Besides the sun and planets, what other bodies exist in the solar system?  Objectives:  23C1 Classify non-planetary objects in the solar system.  23C2 Describe the small bodies in our solar system.  23C3 Explain where non-planetary objects may be found in the solar system. |
| 166–67 | Review and Test Days | | | Chapter 23 Test | |
| Chapter 24: Stars, Galaxies, and the Universe (6 days)  Key Chapter | | | | | |
| 168 | 24A Stars | 588–600 | 588–600 | Info Boxes: Mapping the Skies, Fingerprinting Stars  Worldview Sleuthing: Extraterrestrial Intelligence  Links: Hubble Space Telescope, James Webb Space Telescope, Starry Night, Scale of Distance to Closest Stars, Constellation Finder Template, Extraterrestrial Intelligence Webquest Rubric, Spectroscopy  Demonstrations: Parallax, Bright-Line Spectra  Lab 24A: Sky Map—Observing Stars and Constellations | EQ: What have we learned about stars through observation?  Objectives:  24A1 Find stars in the sky using constellations.  24A2 Describe ways that stars are named.  24A3 Identify and describe the common properties of stars.  24A4 Compare the sun with other stars.  24A5 Classify stars by their luminosity and color.  24A6 Describe the common remnants of stars after they die. |
| 169 | 24B Gas to Galaxies | 601–6 | 601–6 | Life Connection: Astrobiology  Links: Scale of the Galaxy, Names of the Milky Way, Sky Survey  Lab 24B: Going the Distance—Understanding Parallax and Stellar Distances | EQ: Besides stars, what else is in the universe?  Objectives:  24B1 Describe and classify various objects in the universe.  24B2 Differentiate between a double star and a binary star.  24B3 Identify and classify various kinds of star clusters.  24B4 Summarize the history leading to the recognition of what a galaxy is.  24B5 Classify galaxies by their shapes and sizes. |
| 170 | Lab Day | | | Lab 24A or Lab 24B | |
| 171 | 24C The Universe and Its Origin | 606–15 | 606–15 | Info Box: Danny Faulkner  Biblical Origins: Theistic Evolution  Links: Red Shift, CMBR, Big Bang theory, Anisotropic Synchrony Convention | EQ: How did the universe form?  Objectives:  24C1 Differentiate between the two competing cosmogonies.  24C2 Discuss evidence used to support the Big Bang theory of cosmogony.  24C3 Summarize various attempts to solve the starlight/distance problem in a creationist theory of cosmogony.  24C4 Validate the significance of Earth and humans in a vast universe. |
| 172–73 | Review and Test Days | | | Chapter 24 Test | |
| Chapter 25: Space Exploration (7 days)  Enrichment Chapter | | | | | |
| 174 | 25A Telescopes | 619–23 | 619–23 | Links: Arecibo Observatory, Hubble Space Telescope, James Webb Space Telescope  Demonstration: Refracting Telescopes  Google Earth Links: Mauna Kea, Arecibo Radio Telescope | EQ: How do telescopes work?  Objectives:  25A1 Evaluate the importance of space exploration.  25A2 Classify telescopes by their structure.  25A3 Explain the function and limitations of various kinds of telescopes. |
| 175 | 25B Rockets, Satellites, and Probes | 624–34 | 624–34 | Careers: Serving God as an Aerospace Engineer  Links: Sputnik, Seven Minutes of Terror, Curiosity  Lab 25A: Reaction Time—Understanding Reaction Engines | EQ: How can we explore space without leaving Earth?  Objectives:  25B1 Explain how a rocket works.  25B2 Identify the challenges of exploring the solar system.  25B3 Contrast satellites, probes, and landers.  25B4 Explain how satellites, probes, and landers are used. |
| 176 | 25C Manned Space Exploration | 635–45 | 635–45 | Case Study: No Safe Return  Life Connection: Critternauts  Links: Man on the Moon, We Choose to Go to the Moon, Project Mercury, Project Gemini, Project Apollo, Lunar Landing, ISS, Night Earth Orbit, ISS Sighting, SpaceX, Virgin Galactic, Model Rocket Rubric, NAR, ESTES™, Quest Aerospace, Aerotech  Lab 25B: Liftoff!—Building and Launching Rockets (2 days) | EQ: Are the benefits of manned space exploration worth the risks?  Objectives:  25C1 Summarize the challenges of sending humans into space.  25C2 Summarize the history of manned space exploration.  25C3 Evaluate the risks and benefits of manned space exploration. |
| 177 | Lab Day 1 | | | Lab 25A or Lab 25B | |
| 178 | Lab Day 2 | | | Lab 25A or Lab 25B | |
| 179–80 | Review and Test Days | | | Chapter 25 Test, Final Exam | |