Science 4, 5th Edition
Lesson Plan Overview

Chapter 1: Plant Structures and Functions

**Act. Activities • EV ExamView • IA Instructional Aid • WL Web Link**

| Pages | Objectives | Printed Resources & Materials | Digital resources | Assessments |
| --- | --- | --- | --- | --- |
| Lesson 1 Overview of External Plant Structures |
| 2–11 | 1.1 Identify five external structures of a plant.1.2 Label the location of external plant structures. | Activities* Plant Parts (p. 1)

Materials* solar system model
* slips of paper
 | Teacher Tools Online* Video: Plants
* Video: Botanist
* WL: Crying Child
 | Quick Check (p. 9) |
| Lesson 2 Roots and Stems |
| 12–17 | 2.1 Identify two kinds of roots and two kinds of stems.2.2 Explain the structures and functions of roots and stems. | Activities* Roots and Stems (p. 3)

Materials* plants for taproot and fibrous root examples
 |  | Quick Check (p. 13)Quick Check (p. 17) |
| Lesson 3 Leaves |
| 18–24 | 3.1 Identify the internal and external structures used in photosynthesis and the functions of each.3.2 Relate photosynthesis to God’s design for living things. BWS Design in Nature (explain) | Teacher Edition * IA 1.1: Photosynthesis
* IA 1.2: Photosynthesis Cards

Activities* Study Guide (pp. 5–7)

Assessments* Quiz 1A
 | Teacher Tools Online* IA 1.1: Photosynthesis
* IA 1.2: Photosynthesis Cards
* WL: Photosynthesis
 | Quick Check (p. 21)Quick Check (p. 24)Quiz 1A |
| Lesson 4 Exploration: Leaf Detective |
| 25 | 4.1 Classify leaves by a chosen characteristic.4.2 Analyze similarities and differences between leaf classifications. | Teacher Edition* IA 1.3: Science Inquiry Skills
* IA 1.4: Science Safety Tips

Activities* Science Inquiry Skills (p. 9)
* Science Safety Tips (p. 10)
* Exploration: Leaf Detective (pp. 11–13)

Assessments* Exploration Rubric

Materials* supplies for leaf classification; see Activities p. 11 for materials
 | Teacher Tools Online* IA 1.3: Science Inquiry Skills
* IA 1.4: Science Safety Tips
* WL: Types of Leaves
 | Exploration Rubric |
|  |
| Lesson 5 Other Plant Structures |
| 26–31 | 5.1 Identify two external parts of a plant that help with reproduction.5.2 Evaluate different views of the origin of thorns.  BWS History of Nature (evaluate)5.3 Explain how thorns benefit some plants. BWS Design in Nature (explain) | Teacher Edition* IA 1.5: Plant Terms

Activities* Origin of Thorns (p. 15)

Materials* plant or stem with thorns, spines, or prickles
* sunglasses
 | Teacher Tools Online* Video: Wearing Our Bible Glasses
* Video: Plant Protection
* IA 1.5: Plant Terms
* WL: The Grand Canyon
 | Quick Check (p. 29)Quick Check (p. 31) |
| Lesson 6 Investigation: Stalked! |
| 32 | 6.1 Predict how temperature affects the movement of water in a plant.6.2 Measure and record data.6.3 Identify controlled, independent, and dependent variables.6.4 Draw conclusions about how temperature affects the movement of water in plants. | Teacher Edition* IA 1.6: Scientific Investigation
* IA 1.7: Scientific Variables

Activities* Scientific Investigation (p. 17)
* Scientific Variables (p. 18)
* Investigation: Stalked! (pp. 19–21)

Assessments* Investigation Rubric

Materials* supplies for celery Investigation; see Activities p. 19 for materials
 | Teacher Tools Online* Video: Hypothesis
* IA 1.6: Scientific Investigation
* IA 1.7: Scientific Variables
 | Investigation Rubric |
| Lesson 7 Uses of Plants |
| 33–37 | 7.1 Give an example of an edible food for each part of a plant.7.2 Describe ways that plants are beneficial. | Teacher Edition* IA 1.8: Plant Part Web

Activities* Edible Plant Parts (p. 23)

Materials* variety of edible plant parts
* cotton stalk, clothing
 | Teacher Tools Online* IA 1.8: Plant Part Web
* WL: Planting a Garden Plant
* WL: Sod House
* WL: From Field to Fabric
 | Quick Check (p. 34)Quick Check (p. 37) |
| Lesson 8 Responses of Plants |
| 38–41 | 8.1 Identify four ways plants respond to the environment. BWS Design in Nature (explain)8.2 Give an example of a way that plants respond to light, touch, gravity, or water. | Activities* Study Guide (pp. 25–26)

Assessments* Quiz 1B

Materials* plant pot, soil, seeds, water
 | Teachers Tools Online* WL: Venus Flytrap
* WL: Vines Growing
 | Quick Check (p. 41)Quiz 1B |
|  |
| Lesson 9 Review |
|  | 9.1 Recall terms and concepts from Chapter 1. | Teacher Edition* IA 1.9: Plant Game Parts
 | Teacher Tools Online* IA 1.9: Plant Game Parts
 |  |
| Lesson 10 Test |
|  | 10.1 Apply terms and concepts from Chapter 1. | Assessments* Test 1
 | Teacher Tools Online* EV: Chapter 1 Test Bank
 | Test 1EV: Chapter 1 Test Bank |

Chapter 2: Plant Reproduction

| Pages | Objectives | Printed Resources & Materials | Digital resources | Assessments |
| --- | --- | --- | --- | --- |
| Lessons 11–12 Flower Structures and Pollination |
| 42–48 | 11–12.1 Identify the structures of a flower and their functions.11–12.2 Explain what pollination is.11–12.3 Identify how pollination occurs. 11–12.4 Explain how God designed the structures and functions of a flowering plant to help the plant reproduce. BWS Design in Nature (explain) | Teacher Edition* IA 2.1: Parts of a Flower

Activities* Parts of a Flower (p. 27)

Materials* wooden pencil
* pictures of a blooming skunk cabbage and a blooming rose
 | Teacher Tools Online* Video: Plant Reproduction
* WL: United States Botanic Garden
* IA 2.1: Parts of a Flower
 | Quick Check (p. 45)Quick Check (p. 48) |
| Lesson 13 Exploration: Find That Seed! |
| 49 | 13.1 Compare a variety of fruit seeds.13.2 Measure the seeds.13.3 Collect and record data about various fruit seeds.13.4 Communicate conclusions about the seeds observed. | Activities * Exploration: Find That Seed! (pp. 29–30)

Assessments* Exploration Rubric

Materials* supplies for seed location exploration; see Activities p. 29 for materials
 |  | Exploration Rubric |
| Lesson 14 Plant Reproduction with Seeds and Fruit |
| 50–54 | 14.1 Identify the plant structure that contains seeds.14.2 Identify the parts of a seed.14.3 Explain how seeds can be dispersed. 14.4 Explain how the structures of fruit and seeds are designed to help the flowering plant survive, grow, and reproduce. BWS Design in Nature (explain) | Activities* Study Guide (pp. 31–33)

Assessments* Quiz 2A

Materials* fruit examples
* seeds from Lesson 13
 | Teacher Tools Online* Video: Pomologist
 | Quick Check (p. 53)Study Guide (Act. pp. 31–33)Quiz 2A |
|  |
| Lessons 15–16 STEM: Up, Up, and Away! |
| 55 | 15–16.1 Design a model of a tool that will disperse seeds by wind, using the engineer­ing design process.15–16.2 Create a tool that will disperse seeds by wind.15–16.3 Test and compare models to improve the original design.15–16.4 Communicate how the design solves the problem. BWS Purpose of Science (explain) | Teacher Edition* IA 2.2: STEM: The Engineering Design Process

Activities* STEM: The Engineering Design Process (p. 35)
* STEM: Up, Up, and Away! (pp. 37–39)

Assessments* STEM Rubric

Materials* supplies for designing seed dispersion tool; see Teacher Edition p. 55 for materials
 | Teacher Tools Online* IA 2.2: STEM: The Engineering Design Process
 | STEM Rubric |
| Lesson 17 Flowering Plant Life Cycle |
| 56–59 | 17.1 Identify the conditions needed for a seed to germinate.17.2 Explain how the design of a flowering plant’s life cycle allows it to survive, grow, and reproduce. BWS Design in Nature (explain)17.3 Differentiate between the seed location of flowering plants and of conifers. | Teacher Edition* IA 2.3: Flowering Plant Stages

Activities* Measure Up: Measuring Length (pp. 41–42)

Materials* ears of corn, dried
 | Teacher Tools Online* WL: Lima Bean Time Lapse
* IA 2.3: Flowering Plant Stages
 | Quick Check (p. 59) |
| Lesson 18 Investigation: Pinecone Pondering |
| 60 | 18.1 Predict the condition under which a pinecone will open and under which condition it will close.18.2 Observe and record data.18.3 Draw conclusions about the open-and-close trait of a pinecone and the tree’s ability to reproduce. BWS Design in Nature (explain) | Activities* Investigation: Pinecone Pondering (pp. 43–45)

Assessments* Investigation Rubric

Materials* pinecones, various shapes and sizes
* supplies for pinecone investigation; see Activities p. 43 for materials
 |  | Investigation Rubric |
| Lesson 19 Other Ways Plants Reproduce |
| 61–63 | 19.1 Identify ways plants can reproduce without seeds.19.2 Explain God’s design for plant reproduction. BWS Design in Nature (explain) | Activities* Study Guide (pp. 47–48)

Assessments* Quiz 2B

Materials* banner paper
* green onion, fresh
 | Teacher Tools Online* WL: Strawberry Plants
* WL: Moss Releasing Spores
 | Quick Check (p. 63)Study Guide (Act. pp. 47–48)Quiz 2B |
| Lesson 20 Review |
|  | 20.1 Recall terms and concepts from Chapter 2. | Materials* supplies for review game
 |  |  |
| Lesson 21 Test |
|  | 21.1 Apply terms and concepts from Chapter 2. | Assessment* Test 2
 | Teacher Tools Online* EV: Chapter 2 Test Bank
 | Test 2EV: Chapter 2 Test Bank |

Chapter 3: Invertebrates

| Pages | Objectives | Printed Resources & Materials | Digital resources | Assessments |
| --- | --- | --- | --- | --- |
| Lesson 22 Arthropods and Insects |
| 64–70 | 22.1 Explain why insects are arthropods.22.2 Explain how insects use external structures to survive and grow.22.3 Compare and contrast complete and incomplete metamorphosis. | Teacher Edition* IA 3.1: Insects

Activities* Insects (p. 49)
* Metamorphosis (p. 50)

Materials* supplies for making a hornet model
* 5 index cards
 | Teacher Tools Online* Video: Invertebrates
* IA 3.1: Insects
* WL: Metamorphosis
 | Quick Check (p. 70) |
| Lesson 23 External Insect Structures and Their Functions |
| 71–76 | 23.1 Evaluate explanations for external insect structures. BWS History of Nature (evaluate)23.2 Describe the external insect structures used for protection and sensing and their functions.23.3 Compare and contrast compound eyes and simple eyes. | Teacher Edition* IA 3.2: Insect Structures
* IA 3.3: External Insect Structures 1
* IA 3.4: External Insect Structures 2
* IA 3.6: Be a Detective 1
* IA 3.7: Be a Detective 2

Activities* External Insect Structures (pp. 51–53)
* Be a Detective (pp. 55–56)
* Study Guide (pp. 57–59)

Assessments* Quiz 3A

Materials* hand lenses
* hornet model from Lesson 22
* sticky notes (tabs)
* cilantro in sandwich bag
 | Teacher Tools Online* Video: Stingers
* IA 3.2: Insect Structures
* IA 3.3: External Insect Structures 1
* IA 3.4: External Insect Structures 2
* IA 3.6: Be a Detective 1
* IA 3.7: Be a Detective 2
* WL: How Dragonflies See the World
 | Quick Check (p. 76)Study Guide (Act. pp. 57–59)Quiz 3A |
| Lesson 24 Investigation: What Big Eyes You Have! |
| 77 | 24.1 Create a model of a compound eye.24.2 Predict similarities and differences between simple- and compound-eye vision.24.3 Observe objects and motion when using the compound-eye model.24.4 Infer a benefit of a compound eye for an insect.24.5 Relate scientific modeling to describing God’s world. BWS Modeling in Science (explain) | Teacher Edition* IA 1.3: Science Inquiry Skills

Activities* Investigation: What Big Eyes You Have! (pp. 61–63)

Assessments* Investigation Rubric

Materials* supplies for compound-eye model; see Activities (p. 61)
 | Teacher Tools Online* IA 1.3: Science Inquiry Skills
 | Investigation Rubric |
|  |
| Lesson 25 Structures for Eating and Moving |
| 78–82 | 25.1 Identify the main types of insect mouthparts.25.2 Explain the relationship between insect mouth structures and what insects eat.25.3 Describe the external insect structures for movement and their functions. | Teacher Edition* IA 3.5: External Insect Structures 3
* IA 3.6: Be a Detective 1
* IA 3.8: Siphoning

Activities* External Insect Structures (pp. 51–53)
* Be a Detective (pp. 55–56)

Materials* supplies representing insect mouthparts
* sticky notes
* hand lenses
 | Teacher Tools Online* IA 3.5: External Insect Structures 3
* IA 3.6: Be a Detective 1
* IA 3.8: Siphoning
 | Quick Check (p. 82) |
| Lesson 26 Butterflies and Moths |
| 83–86 | 26.1 Compare and contrast the external structures and behaviors of butterflies and moths.26.2 Compare and contrast the pupa stage of metamorphosis in butterflies and moths. | Activities* Study Guide (pp. 67–68)

Assessments* Quiz 3B

Materials* 7 assorted pictures of butterflies and moths
 | Teacher Tools Online* WL: Day-Flying Moths
* WL: Butterfly or Moth?
 | Quick Check (p. 86)Study Guide (Act. pp. 67–68)Quiz 3B |
| Lessons 27–28 Exploration: Arthropod Architecture |
| 87 | 27–28.1 Design a model of an imaginary insect using scientific terms for structures and functions.27–28.2 Create a model of an imaginary insect.27–28.3 Communicate how the imaginary insect lives and survives in its environment. | Teacher Edition* IA 1.3: Science Inquiry Skills
* IA 3.9: Environment

Activities* Exploration: Arthropod Architecture (pp. 69–71)

Assessments* Exploration Rubric

Materials* supplies for imaginary-insect model; see Activities (p. 69)
 | Teacher Tools Online* IA 1.3: Science Inquiry Skills
* IA 3.9: Environment
 | Exploration Rubric |
| Lessons 29–30 Social Insects |
| 88–96 | 29–30.1 Explain the instincts God has given all social insects. BWS Design in Nature (explain)29–30.2 Describe how social insects work together to survive and grow.29–30.3 Describe how social insects communicate. | Activities* Study Guide (pp. 73–75)

Assessments* Quiz 3C

Materials* piece of wrapped candy
 | Teacher Tools Online* Video: Bees and Honeycombs
* Video: Beekeeper
* WL: Ant Hill
 | Quick Check (p. 90)Quick Check (p. 96)Study Guide (Act. pp. 73–75)Quiz 3C |
|  |
| Lessons 31–32 Exploration: Insect Collection |
| 97 | 31–32.1 Create an insect collection.31–32.2 Observe insects and record data.31–32.3 Identify insects.31–32.4 Communicate insect structures and their functions by using the collection. | Teacher Edition* IA 1.3: Science Inquiry Skills

Activities* Exploration: Insect Collection (pp. 77–81)

Assessments* Exploration Rubric

Materials* supplies for insect collection; see Activities page 77 for list of materials
 | Teacher Tools Online* IA 1.3: Science Inquiry Skills
* WL: Insects
 | Exploration Rubric |
| Lesson 33 Review |
|  | 33.1 Recall terms and concepts from Chapter 3. | Materials* supplies for review game
 |  |  |
| Lesson 34 Test |
|  | 34.1 Apply terms and concepts from Chapter 3. | Assessments* Test 3
 | Teacher Tools Online* EV: Chapter 3 Test Bank
 | Test 3EV: Chapter 3 Test Bank |

Chapter 4: Vertebrates

| Pages | Objectives | Printed Resources & Materials | Digital resources | Assessments |
| --- | --- | --- | --- | --- |
| Lesson 35 External Structures and Functions |
| 98–105 | 35.1 Compare and contrast external vertebrate structures and their functions for covering or for moving and how they affect vertebrate survival and behavior.35.2 Identify an animal’s environment based on its external structures.35.3 Compare and contrast different views regarding the origin of some vertebrates. BWS History of Nature (evaluate) | Teacher Edition* IA 4.1: Movement Structures

Activities* Covering and Moving (pp. 83–84)

Materials* supplies for a bat wing demonstration
 | Teacher Tools Online* Video: Vertebrates
* IA 4.1: Movement Structures
* WL: Flight
* WL: Coverings
 | Quick Check (p. 105) |
| Lessons 36–37 External Structures for Sensing |
| 106–14 | 36–37.1 Relate vertebrate mouthparts to vertebrate diets.36–37.2 Explain how vertebrates use sensory structures to survive and grow. | Teacher Edition* IA 3.6: Be a Detective 1
* IA 3.7: Be a Detective 2

Activities* Answers in Genesis: Big Sharp Teeth (pp. 85–86)
* Study Guide (pp. 87–90)

Assessments* Quiz 4A

Materials* supplies for the Sensing hands-on activity
* sticky notes
* supplies for the Worldview Expansion demonstration
 | Teacher Tools Online* Video: Hummingbird Tongues
* IA 3.6: Be a Detective 1
* IA 3.7: Be a Detective 2
* WL: Dive Bomb
* WL: Frog’s Tongue
* WL: Bats and Echolocation
 | Quick Check (p. 111)Quick Check (p. 114)Study Guide (Act. pp. 87–90)Quiz 4A |
| Lesson 38 Investigation: Bird Beak Buffet |
| 115 | 38.1 Predict which beak is most efficient for a given food. 38.2 Experiment with imitation beaks and given food sources.38.3 Infer the relationship between the shape of bird beaks and bird diet.38.4 Infer why different kinds of birds can live in the same environment.38.5 Infer what will happen to all the birds in one area if they all had the same type of beak. | Activities* Investigation: Bird Beak Buffet (pp. 91–94)

Assessments* Investigation Rubric

Materials* supplies for modeling bird beaks; see Teacher Edition p. 115 for materials
 | Teacher Tools Online* WL: Bird Beaks
 | Investigation Rubric |
|  |
| Lesson 39 External Structures for Defense |
| 116–18 | 39.1 Explain how God’s design helps vertebrates adapt to a world with predators. BWS Design in Nature (explain)39.2 Relate external vertebrate structures to how vertebrates defend themselves. | Teacher Edition* IA 4.2: Defending against Predators
* IA 4.3: For Defense

Activities* For Defense (p. 95)
* Study Guide (p. 97)

Assessments* Quiz 4B

Materials* sticky notes
 | Teacher Tools Online* Video: Antivenin
* IA 4.2: Defending against Predators
* IA 4.3: For Defense
* WL: Defense Structures
* WL: Horned Lizard
 | Quick Check (p. 118)Study Guide (Act. p. 97)Quiz 4B |
| Lessons 40–41 STEM: Mimic the Master Designer and Engineer |
| 119 | 40–41.1 Design a device that will use biomimicry, using the engineering design process.40–41.2 Create a device that will use biomimicry.40–41.3 Test and compare models to improve the original design.40–41.4 Communicate how the design solves the problem. BWS Design in Nature (apply) | Teacher Edition* IA 2.2: STEM: The Engineering Design Process

Activities* STEM: Mimic the Master Designer and Engineer (pp. 99–101)

Assessments* STEM Rubric

Materials* supplies for the biomimicry design model; see Teacher Edition p. 119 for materials
 | Teacher Tools Online* WL: Natural Design
* WL: Kingfisher and Bullet Train
 | STEM Rubric |
| Lesson 42 Internal Vertebrate Body Systems |
| 120–25 | 42.1 Relate internal vertebrate structures and functions to the body system for survival.42.2 Explain how vertebrates use internal structures to survive and grow. | Teacher Edition* IA 4.4: Structures
* IA 4.5: Skeletal System
* IA 4.6: Circulatory System
* IA 4.7: Respiratory System
* IA 4.8: Digestive System

Activities* Vertebrate Systems (pp. 103–5)

Materials* sticky notes
 | Teacher Tools Online* Video: Wildlife Photographer
* IA 4.4: Structures
* IA 4.5: Skeletal System
* IA 4.6: Circulatory System
* IA 4.7: Respiratory System
* IA 4.8: Digestive System
 | Quick Check (p. 124)Sticky Note Matching Game |
|  |
| Lesson 43 Vertebrate Nervous System and Responses |
| 126–28 | 43.1 Identify the vertebrate nervous system structures and functions. 43.2 Distinguish between internal and external stimuli.43.3 Identify ways an animal responds to stimuli. | Teacher Edition* IA 4.9: Stimulus

Activities* Study Guide (pp. 107–8)

Assessments* Quiz 4C

Materials* supplies for Responses demonstration; see Teacher Edition p. 126 for materials
* slips of paper
 | Teacher Tools Online* IA 4.9: Stimulus
 | Quick Check (p. 128)Study Guide (Act. pp. 107–8)Quiz 4C |
| Lessons 44–45 Exploration: Creature Feature WebQuest |
| 129 | 44–45.1 Research data about vertebrate structures, functions, and responses, using a WebQuest.44–45.2 Record data about animal structures, functions, and responses. 44–45.3 Create a poster with two structures or responses.44–45.4 Communicate structures, functions, and responses by using the poster. | Activities* Exploration: Creature Feature WebQuest (pp. 109–11)

Assessments* Exploration Rubric

Materials* supplies for the WebQuest; see Activities p. 109 for materials
 | Teacher Tools Online* WL: Creature Feature WebQuest Journey
 | Exploration Rubric |
| Lesson 46 Review |
|  | 46.1 Recall terms and concepts from Chapter 4. | Teacher Edition* IA 4.10: Stimuli Game
 | Teacher Tools Online* IA 4.10: Stimuli Game
 |  |
| Lesson 47 Test |
|  | 47.1 Apply terms and concepts from Chapter 4. | Assessments* Test 4
 | Teacher Tools Online* EV: Chapter 4 Test Bank
 | Test 4EV: Chapter 4 Test Bank |

Chapter 5: Human Digestive System

| Pages | Objectives | Printed Resources & Materials | Digital resources | Assessments |
| --- | --- | --- | --- | --- |
| Lesson 48 The Digestive System |
| 130–36 | 48.1 Compare and contrast how humans, animals, and plants get their energy.  BWS Design in Nature (explain)48.2 Identify the structures and functions in the mouth that aid in digestion.48.3 Identify the hard covering that protects teeth.48.4 Describe the five tastes that taste buds respond to. | Teacher Edition* IA 5.1: Learning Progress Grid
* IA 5.2: Digestive System

Activities* Digestion (p. 113)

Materials* materials for taste bud demonstration
 | Teacher Tools Online* Video: Human Digestive System
* IA 5.1: Learning Progress Grid
* IA 5.2: Digestive System
* WL: Your Teeth
 | Quick Check (p. 134)Quick Check (p. 136) |
| Lesson 49 Investigation: Does Smell Affect Taste? |
| 137 | 49.1 Predict whether smell affects taste.49.2 Record data and observations.49.3 Identify controlled, independent, and dependent variables.49.4 Relate the sense of smell to the sense of taste. | Teacher Edition* IA 1.3: Science Inquiry Skills

Activities* Investigation: Does Smell Affect Taste?

Assessments* Investigation Rubric

Materials* supplies for smell and taste identification; see Activities p. 115 for materials
 | Teacher Tools Online* IA 1.3: Science Inquiry Skills
 | Investigation Rubric |
| Lesson 50 Upper Digestive Tract |
| 138–41 | 50.1 Identify the structures and functions of the throat and the stomach that aid in digestion.50.2 Explain two ways that the stomach works to digest food. | Teacher Edition* IA 5.2: Digestive System

Activities* Digestion (p. 113)

Materials* balloon, uninflated
 | Teacher Tools Online* IA 5.2: Digestive System
 | Quick Check (p. 141) |
| Lesson 51 Lower Digestive Tract & Other Digestive Organs |
| 142–45 | 51.1 Identify functions of the small and large intestines that aid in digestion.51.2 Identify three organs outside the digestive tract that aid in digestion.51.3 Explain how the three organs outside the digestive tract aid in digestion. | Teacher Edition* IA 5.2: Digestive System

Activities* Digestion (p. 113)
* Study Guide (pp. 119–21)

Assessments* Quiz 5A

Materials* meter stick
* masking tape
 | Teacher Tools Online* IA 5.2: Digestive System
* WL: Diabetes
 | Quick Check (p. 145)Study Guide (Act. pp. 119–21)Quiz 5A |
|  |
| Lesson 52 Exploration: Where Does Food Go? |
| 146 | 52.1 Model the organs that make up the digestive system. BWS Modeling in Science (explain)52.2 Illustrate the path that food follows through the digestive tract. | Activities* Exploration: Where Does Food Go? (pp. 123–27)

Assessments* Exploration Rubric

Materials* supplies for digestive system model; see Activities p. 123 for materials
* supplies for the demonstration of the digestive system
 | Teacher Tools Online* WL: Journey through the Digestive System
 | Exploration Rubric |
| Lesson 53 Nutrition |
| 147–51 | 53.1 Explain the relationship among food, calories, and energy.53.2 Classify foods using the five basic food groups.53.3 Summarize the benefits of eating meals together as a family. BWS Importance of Humans (explain) | Activities* Five Food Groups (p. 129)
 | Teacher Tools Online* Video: Colors of Vegetables
* Video: Nutritionist
 | Quick Check (p. 149)Quick Check (p. 150) |
| Lesson 54 Exploration: What’s on Your Plate? |
| 152 | 54.1 Record daily food intake for one day.54.2 Compare daily food intake with the recommended daily servings for each food group.54.3 Recommend one way to improve healthy food choices. BWS Importance of Humans (apply) | Activities* Exploration: What’s on Your Plate? (pp. 131–34)

Assessments* Exploration Rubric
 | Teacher Tools Online* WL: Healthy Eating
 | Exploration Rubric |
| Lesson 55 Nutrients |
| 153–58 | 55.1 Identify types of nutrients the body needs. BWS Importance of Humans (explain)55.2 Analyze various food labels.55.3 Classify foods by nutritional content. | Activities* Study Guide (pp. 135–37)

Assessments* Quiz 5B

Materials* supplies for fruit-infused water
* supplies for water demonstration
 | Teacher Tools Online* Video: Vitamins and Minerals
 | Quick Check (p. 156)Quick Check (p. 158)Study Guide (Act. pp. 135–37)Quiz 5B |
|  |
| Lesson 56 Investigation: Starchy Foods |
| 159 | 56.1 Predict which foods contain starch.56.1 Identify the foods that contain starch, using iodine.56.1 Draw conclusions about the starch content of the foods tested. | Activities* Investigation: Starchy Foods (pp. 139–40)

Assessments* Investigation Rubric

Materials* supplies for starchy foods Investigation; see Activities p. 139 for materials
 |  | Investigation Rubric |
| Lesson 57 Review |
|  | 57.1 Recall terms and concepts from Chapter 5. | Materials* supplies for review game
 |  |  |
| Lesson 58 Test |
|  | 58.1 Apply terms and concepts from Chapter 5. | Assessments* Test 5
 | Teacher Tools Online* EV: Chapter 5 Test Bank
 | Test 5EV: Chapter 5 Test Bank |

Chapter 6: Human Skeletal and Muscular Systems

| Pages | Objectives | Printed Resources & Materials | Digital resources | Assessments |
| --- | --- | --- | --- | --- |
| Lesson 59 Bones |
| 160–67 | 59.1 Identify several bones in the human body.59.2 Explain how the bones of the human body support and protect.59.3 Identify the parts of a bone and the purpose of marrow.59.4 Explain why it is important for bones to store minerals. BWS Design in Nature (explain) | Teacher Edition* IA 6.1: The Skeleton

Activities* The Skeleton (p. 141)

Materials* large marshmallow, per student
* straws
* chenille stems
 | Teacher Tools Online* Video: Human Skeletal and Muscular Systems
* IA 6.1: The Skeleton
 | Quick Check (p. 164)Quick Check (p. 167) |
| Lesson 60 Exploration: A Bone to Pick |
| 168 | 60.1 Research the human skeleton using an internet keyword search.60.2 Observe the structure and location of the main bones of the human body, using diagrams from the internet research.60.3 Create a model of the human skeleton.60.4 Draw conclusions about bones of the human skeleton using the model. BWS Modeling in Science (explain) | Activities* Exploration: A Bone to Pick (pp. 143–44)

Assessments* Exploration Rubric

Materials* x-ray image of human bones
* supplies for human skeleton model; see Activities p. 143 for materials
 |  | Exploration Rubric |
| Lesson 61 Joints |
| 169–71 | 61.1 Differentiate between immovable and movable joints.61.2 Compare three types of movable joints.61.3 Identify the location and function of ligaments and cartilage.61.4 Explain how bones, ligaments, and cartilage work together according to God’s design. BWS Design in Nature (explain) | Activities* Study Guide (pp. 145–47)

Assessments* Quiz 6A

Materials* index card, per student
* sticky notes
 | Teacher Tools Online* Video: Double-Jointedness
 | Quick Check (p. 171)Study Guide (Act. pp. 145–47)Quiz 6A |
|  |
| Lesson 62 Exploration: X-Ray Vision |
| 172 | 62.1 Create a model to demonstrate the bones in the hand and wrist and the movement of these bones.62.2 Evaluate the model’s representation of the bones and their movement. BWS Modeling in Science (evaluate)62.3 Draw conclusions about the movement of the hand and wrist. | Activities* Exploration: X-Ray Vision (pp. 149–51)

Assessments* Exploration Rubric

Materials* supplies for hand-and-wrist bone exploration; see Activities p. 149 for materials
 |  | Exploration Rubric |
| Lesson 63 Exploration: Moving Muscles |
| 173 | 63.1 Create a model of the bones and muscles of the upper and lower arm.63.2 Demonstrate how the bones and muscles work together, using the model.63.3 Draw conclusions about how bones and muscles work together. BWS Design in Nature (explain) | Activities* Exploration: Moving Muscles (pp. 153–55)

Assessments* Exploration Rubric

Materials* supplies for bones-and-muscles exploration; see Activities p. 153 for materials
 | Teacher Tools Online* WL: The Muscular System
 | Exploration Rubric |
| Lesson 64 Muscles |
| 174–77 | 64.1 Explain how muscles and bones work together according to God’s design. BWS Design in Nature (explain)64.2 Differentiate between voluntary and involuntary muscles.64.3 Identify examples of voluntary and involuntary muscles.64.4 Evaluate explanations about why humans have bones, muscles, and joints. BWS Design in Nature (evaluate) | Activities* Answers in Genesis: The Master Designer (pp. 157–58)

Materials* banner paper
* bone-and-muscle model from Lesson 63
 | Teacher Tools Online* Video: Muscle Names
 | Quick Check (p. 177) |
| Lesson 65 Diet and Exercise |
| 178–81 | 65.1 Explain how healthy bones and muscles are maintained.65.2 Formulate a plan to maintain healthy bones and muscles. BWS Design in Nature (apply)65.3 Differentiate between fracture, strain, and sprain. | Activities* Meal Plan for Healthy and Strong Bones and Muscles (p. 159)
* Exercise Plan for Healthy and Strong Bones and Muscles (p. 161)
* Study Guide (pp. 163–64)

Assessments* Quiz 6B
 | Teacher Tools Online* Video: The Astronaut’s Muscles
* Video: Physical Therapist
 | Quick Check (p. 181)Study Guide (Act. pp. 163–64)Quiz 6B |
|  |
| Lesson 66 Review |
| 160–81 | 66.1 Recall terms and concepts from Chapter 6. | Materials* supplies for review game
 |  |  |
| Lesson 67 Test |
|  | 67.1 Apply terms and concepts from Chapter 6. | Assessments* Test 6
 | Teacher Tools Online* EV: Chapter 6 Test Bank
 | Test 6EV: Chapter 6 Test Bank |

Chapter 7: Energy and Motion

| Pages | Objectives | Printed Resources & Materials | Digital resources | Assessments |
| --- | --- | --- | --- | --- |
| Lesson 68 Potential and Kinetic Energy |
| 182–89 | 68.1 Identify what energy is and where it came from. BWS History of Nature (explain)68.2 Distinguish between potential energy and kinetic energy.68.3 Explain how energy changes from one form to another.68.4 Identify cause-and-effect relationships of energy. | Teacher Edition* IA 7.1: Frayer Model
* IA 7.2: Vocabulary 1
* IA 7.3: Vocabulary 2
* IA 7.4: Graphs
* IA 7.5: Cause and Effect

Activities* Cause and Effect (pp. 165–66)
* Study Guide (p. 167)

Assessments* Quiz 7A

Materials* supplies for potential and kinetic energy demonstration
* 3 dominoes
* kickball or soccer ball
 | Teacher Tools Online* Video: Energy and Motion
* IA 7.1: Frayer Model
* IA 7.2: Vocabulary 1
* IA 7.3: Vocabulary 2
* IA 7.4: Graphs
* IA 7.5: Cause and Effect
* WL: Watermelon
* WL: Roller Coaster
 | Quick Check (p. 189)Study Guide (Act. p. 167)Quiz 7A |
| Lesson 69 Investigation: Zoom Racer 500 |
| 190 | 69.1 Construct a spool racer.69.2 Use scientific terms while testing a spool racer.69.3 Identify the variables.69.4 Infer design changes to the spool racer to effect different outcomes. | Teacher Edition* IA 1.7: Scientific Variables

Activities* Investigation: Zoom Racer 500 (pp. 169–71)

Assessments* Investigation Rubric

Materials* supplies for Zoom Racer Investigation; see Activities p. 169 for materials
* marker
 | Teacher Tools OnlineIA 1.7: Scientific VariablesWL: Spool Racer | Investigation Rubric |
|  |
| Lesson 70 Inquiry: Zoom Racer 500 |
| 190 | 70.1 Construct a spool racer with a change in one material from the Investigation.70.2 Use scientific terms while designing, constructing, and testing a spool racer.70.3 Draw conclusions about how a change in design affects the kinetic energy of the spool racer. | Teacher Edition* IA 1.7: Scientific Variables

Activities* Investigation: Zoom Racer 500 (pp. 169–71)
* Inquiry: Zoom Racer 500 (pp. 173–75)

Assessments* Inquiry Rubric

Materials* Zoom Racers from Lesson 69
* supplies for Zoom Racers; see Activities p. 173 for materials
* different sizes of rubber bands, metal washers, and pencils
 | Teacher Tools Online* IA 1.7: Scientific Variables
 | Inquiry Rubric |
| Lesson 71 Force, Weight, Speed |
| 191–93 | 71.1 Relate motion, force, and energy.71.2 Explain how weight affects the energy of motion.71.3 Relate an object’s speed to that object’s energy. BWS Design in Nature (explain)71.4 Create a rocket design that shows the relationship between speed and energy.71.5 Determine the rocket design by using the available materials. | Teacher Edition* IA 7.3: Vocabulary 2
* IA 7.7: Applying Force
* IA 7.8: Vocabulary 3

Activities* Force, Weight, Speed (p. 177)

Materials* toy car
* supplies for rocket demonstration
 | Teacher Tools Online* IA 7.3: Vocabulary 2
* IA 7.7: Applying Force
* IA 7.8: Vocabulary 3
* WL: Falcon 9 Launch
 | Quick Check (p. 193) |
| Lesson 72 Energy Transfer |
| 194–98 | 72.1 Describe how energy transfers from one place to another or from one form to another.72.2 Use science vocabulary terms in various scenarios. 72.3 Experiment to find out how energy can be transferred from one object to another. | Teacher Edition* IA 7.8: Vocabulary 3
* IA 7.9: Vocabulary 4

Activities* Energy Transfer (pp. 179–80)

Materials* tennis ball, small bouncy ball, or racquetball
* supplies for energy transfer demonstrations
* rubber popper toys
* goggles
 | Teacher Tools Online* Video: HVAC Technician
* IA 7.8: Vocabulary 3
* IA 7.9: Vocabulary 4
* WL: Newton’s Cradle
 | Quick Check (p. 197) |
|  |
| Lesson 73 Energy Transfer and Collisions |
| 199–203 | 73.1 Experiment with marbles of different sizes to see how collisions transfer energy from one object to another. 73.2 Explain how energy is transferred from one object to another during a collision.73.3 Analyze energy and motion before, during, and after a collision.73.4 Compose a statement that shows how you could use the knowledge of motion and energy to obey God’s commands. BWS Purpose of Science (apply) | Teacher Edition* IA 7.9: Vocabulary 4

Activities* Study Guide (pp. 181–83)

Assessments* Quiz 7B

Materials* supplies for a marble activity
* Newton’s cradle
 | Teacher Tools Online* IA 7.9: Vocabulary 4
* WL: Newton’s Cradle
 | Quick Check (p. 203)Study Guide (Act. pp. 181–83)Quiz 7B |
| Lesson 74 Exploration: Copper Caper |
| 204 | 74.1 Explore to find out how energy can be transferred from one object to another using pennies.74.2 Record outcomes about the changes in energy that occur when objects collide.74.3 Compose an explanation relating an object’s speed to that object’s energy. | Activities* Exploration: Copper Caper (pp. 185–87)

Assessments* Exploration Rubric

Materials* supplies for the copper caper exploration; see Activities p. 185 for materials
 |  | Exploration Rubric |
| Lessons 75–76 STEM Whirlwind of Wheels |
| 205 | 75–76.1 Design a sail car that will use wind energy using the engineering design process.75–76.2 Create a sail car with available materials.75–76.3 Test and compare models to improve the original design.75–76.4 Communicate how the design solves the problem. BWS Purpose of Science (explain)75–76.5 Discuss what the best performing sail cars have in common. | Activities* STEM: Whirlwind of Wheels (pp. 189–91)

Assessments* STEM Rubric

Materials* supplies for the STEM activity; see Teacher Edition p. 205 for materials
 | Teacher Tools Online* WL: Sail Cars
 | STEM Rubric |
| Lesson 77 Review |
|  | 77.1 Recall terms and concepts from Chapter 7. | Teacher Edition* IA 7.10: Roller Coaster Cars
 | Teacher Tools Online* IA 7.10: Roller Coaster Cars
 |  |
| Lesson 78 Test |
|  | 78.1 Apply terms and concepts from Chapter 7. | Assessments* Test 7
 | Teacher Tools Online* EV: Chapter 7 Test Bank
 | Test 7EV: Chapter 7 Test Bank |

Chapter 8: Energy and Work

| Pages | Objectives | Printed Resources & Materials | Digital resources | Assessments |
| --- | --- | --- | --- | --- |
| Lesson 79 Forces |
| 206–12 | 79.1 Identify what the forces of gravity andfriction are.79.2 Explain how gravity and friction can be beneficial. BWS Design in Nature (explain)79.3 Relate force, weight, and motion.79.4 Relate work and energy.79.5 Relate the amount of work done to force and distance. | Teacher Edition* IA 8.1: Anticipation Guide: Energy and Work

Materials* rope
 | Teacher Tools Online* Video: Energy and Work
* IA 8.1: Anticipation Guide: Energy and Work
 | Quick Check (p. 209)Quick Check (p. 212) |
| Lesson 80 Investigation: Friction Fun |
| 213 | 80.1 Predict which surface has the most friction.80.2 Measure the distance that a ball rolls on various surfaces.80.3 Record and graph data.80.4 Infer why knowing about the friction of various surfaces is beneficial. BWS Importance of Humans (explain) | Activities* Investigation: Friction Fun (pp. 193–95)

Assessments* Investigation Rubric

Materials* picture of a bowling alley lane
* supplies for friction investigation; see Activities p. 193 for materials
 |  | Investigation Rubric |
| Lesson 81 Simple Machines: Lever |
| 214–17 | 81.1 Explain why simple machines are beneficial. BWS Importance of Humans (explain)81.2 Differentiate between effort and load.81.3 Explain the purpose and function of a lever and a fulcrum.81.4 Identify examples of levers. | Activities* Study Guide (pp. 197–99)

Assessments* Quiz 8A

Materials* hand-crank pencil sharpener; hand-crank mixer or eggbeater
* ruler
 | Teacher Tools Online* Video: Levers and Catapults
* Video: Built-In Levers
 | Quick Check (p. 217)Study Guide (Act. pp. 197–99)Quiz 8A |
|  |
| Lesson 82 Investigation: How Much Effort? |
| 218 | 82.1 Predict how the position of the fulcrum affects the amount of effort needed to balance the load.82.2 Experiment to determine how the position of the fulcrum affects the amount of effort.82.3 Identify the controlled and independent variables in the experiment.82.4 Draw conclusions about the position of the fulcrum and the amount of effort needed to balance the load. | Teacher Edition* IA 1.3: Science Inquiry Skills
* IA 1.7: Scientific Variables
* IA 8.2: Seesaw Effort

Activities* Investigation: How Much Effort? (pp. 201–3)

Assessments* Investigation Rubric

Materials* supplies for effort investigation; see Activities p. 201 for materials
 | Teacher Tools Online* IA 1.3: Science Inquiry Skills
* IA 1.7: Scientific Variables
* IA 8.2: Seesaw Effort
 | Investigation Rubric |
| Lesson 83 Inquiry: How Much Effort? |
| 218 | 83.1 Hypothesize how the length of the lever affects how the effort and load balance.83.2 Experiment to determine how the length of the lever affects how the effort and load balance.83.3 Identify the controlled and independent variables in the experiment.83.4 Draw conclusions about how the length of the lever affects how the effort and load balance. | Activities* Inquiry: How Much Effort? (pp. 205–6)

Assessments* Inquiry Rubric

Materials* supplies for effort inquiry; see Activities p. 205 for materials
 |  | Inquiry Rubric |
| Lesson 84 Simple Machines: Wheel and Axle; Pulley |
| 219–23 | 84.1 Compare the distances a wheel and its axle move in one rotation.84.2 Relate effort and distance to the wheel and axle.84.3 Identify the directions of the effort and the load when using a pulley.84.4 Identify examples of objects that use a wheel and axle or a pulley.84.5 Explain how the wheel and axle and the pulley are beneficial. BWS Purpose of Science (explain) | Materials* toy car
* supplies for rotation demonstration
 | Teacher Tools Online* WL: Wheel and Axle
 | Quick Check (p. 220)Quick Check (p. 223) |
| Lesson 85 Simple Machines: Inclined Plane |
| 224–27 | 85.1 Identify what an inclined plane is.85.2 Explain how an inclined plane is beneficial.85.3 Propose a plan for using an inclined plane to help others. BWS Importance of Humans (apply)85.4 Relate a screw and a wedge to an inclined plane. | Teacher Edition* IA 8.1: Anticipation Guide: Energy and Work

Activities* Answers in Genesis: Tools for the Job (pp. 207–8)
* Study Guide (pp. 209–11)

Assessments* Quiz 8B
 | Teacher Tools Online* Video: Animals as Simple Machines
* Video: Carpenter
* IA 8.1: Anticipation Guide: Energy and Work
* WL: Inclined Plane
* WL: Wedges and Screws
 | Quick Check (p. 226)Study Guide (Act. pp. 209–11)Quiz 8B |
| Lesson 86 Investigation: Vroom, Vroom! |
| 228 | 86.1 Predict the amount of force needed as the slope of an inclined plane increases.86.2 Experiment to determine if the amount of force will increase or decrease as the slope of an inclined plane increases.86.3 Identify the independent variable.86.4 Draw conclusions about the amount of force needed as the slope of an inclined plane increases. | Activities* Investigation: Vroom, Vroom! (pp. 213–14)

Assessments* Investigation Rubric

Materials* supplies for force investigation; see Activities p. 213 for materials
 |  | Investigation Rubric |
| Lesson 87 Inquiry: Vroom, Vroom! |
| 228 | 87.1 Formulate a hypothesis to predict the amount of force needed to move toy cars of different weights up a steep hill.87.2 Experiment to determine the amount of force needed to move cars of different weights up a steep hill.87.3 Identify and control variables.87.4 Draw conclusions about how the weight of an object affects the force needed to move that object. | Activities* Inquiry: Vroom, Vroom! (pp. 215–16)

Assessments* Inquiry Rubric

Materials* supplies for force inquiry; see Activities p. 215 for materials
 |  | Inquiry Rubric |
| Lessons 88–89 STEM: On the Move with Simple Machines |
| 229 | 88–89.1 Design three simple machines that will help to move a heavy load, using the engineering design process.88–89.2 Create one simple machine that will move an object.88–89.3 Test and compare simple machines.88–89.4 Communicate how each design solves the problem. BWS Purpose of Science (apply) | Teacher Edition* IA 2.2: STEM: The Engineering Design Process

Activities* STEM: On the Move with Simple Machines (pp. 217–20)

Assessments* STEM Rubric

Materials* supplies for designing a simple machine; see Teacher Edition p. 229 for suggested materials
 | Teacher Tools Online* IA 2.2: STEM: The Engineering Design Process
 | STEM Rubric |
| Lesson 90 Review |
|  | 90.1 Recall terms and concepts from Chapter 8. | Materials* supplies for review game
 |  |  |
| Lesson 91 Test |
|  | 91.1 Apply terms and concepts from Chapter 8. | Assessments* Test 8
 | Teacher Tools Online* EV: Chapter 8 Test Bank
 | Test 8EV: Chapter 8 Test Bank |

Chapter 9: Waves

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Pages | Objectives | Printed Resources & Materials | Digital resources | Assessments |
| Lessons 92–93 Waves |
| 230–38 | 92–93.1 Explain how a wave travels.92–93.2 Relate waves to the energy they transfer. BWS Design in Nature (explain)92–93.3 Identify three wave patterns.92–93.4 Identify properties of transverse and longitudinal waves.92–93.5 Calculate the frequency of transverse waves.92–93.6 Measure the wavelength of different wave patterns. | Teacher Edition* IA 9.1: Transverse Wave

Activities* Waves (pp. 221–22)
* Study Guide (pp. 223–25)

Materials* supplies for wave demonstrations
* supplies for rest position demonstration
* centimeter rulers
 | Teacher Tools Online* Video: Waves
* IA 9.1: Transverse Wave
* WL: Stadium Wave Simulation
 | Quick Check (p. 234)Quick Check (p. 238)Study Guide (Act. pp. 223–25) |
| Lesson 94 Exploration: Let’s Wave! |
| 239 | 94.1 Model and label four components of a transverse wave.94.2 Model transverse and longitudinal wave patterns with a coiled spring toy.94.3 Measure the speed of transverse and longitudinal waves using a coiled spring toy.94.4 Compare and contrast the movement of a transverse wave with the movement of a longitudinal wave using a coiled spring toy. | Activities* Exploration: Let’s Wave! (pp. 227–31)

Assessments* Exploration Rubric

Materials* supplies for wave models; see Activities p. 227 for materials
 | Teacher Tools Online* WL: Waves
 | Exploration Rubric |
| Lesson 95 Review |
|  | 95.1 Recall terms and concepts from Chapter 9. | Materials* game tokens
 |  |  |
| Lesson 96 Test |
|  | 96.1 Apply terms and concepts from Chapter 9. | Assessments* Test 9
 | Teacher Tools Online* EV: Chapter 9 Test Bank
 | Test 9EV: Chapter 9 Test Bank |

Chapter 10: Light

| Pages | Objectives | Printed Resources & Materials | Digital resources | Assessments |
| --- | --- | --- | --- | --- |
| Lessons 97–98 Light Characteristics |
| 240–48 | 97–98.1 Evaluate different worldviews regarding the origin of light. BWS History of Nature (evaluate)97–98.2 Identify what light is.97–98.3 Differentiate between luminous and nonluminous objects.97–98.4 Differentiate between transparent, translucent, and opaque objects. | Teacher Edition* IA 10.1: All about Light

Activities* All about Light (p. 233)
* Study Guide (pp. 235–36)

Assessments* Quiz 10A

Materials* flashlight
* supplies for the flashlight activity
 | Teacher Tools Online* Video: Light
* Video: Moonlight
* IA 10.1: All about Light
 | Quick Check (p. 244)Quick Check (p. 248)Study Guide (Act. pp. 235–36)Quiz 10A |
| Lesson 99 Investigation: Light Hunters |
| 249 | 99.1 Complete a hypothesis for various objects to determine how each object will interact with light.99.2 Record observations.99.3 Classify objects as either opaque, translucent, or transparent.99.4 Draw conclusions from data collected.99.5 Devise another way to test how light interacts with objects. | Activities* Investigation: Light Hunters (pp. 237–40)

Assessments* Investigation Rubric

Materials* supplies for transparent, translucent, and opaque investigation; see Activities p. 237 for materials
 |  | Investigation Rubric |
| Lesson 100 Colors of Light |
| 250–53 | 100.1 Relate electromagnetic energy, wavelengths, and visible light to God’s design of the human eye. BWS History of Nature (explain)100.2 Relate visible white light to a prism and a rainbow.100.3 Explain the origin of the rainbow and its purpose. BWS History of Nature (explain)100.4 Identify the colors of the visible spectrum. | Teacher Edition* IA 9.1: Transverse Wave

Activities* Colors of Light (pp. 241–42)

Materials* prism
* flashlight
 | Teacher Tools Online* Video: Rainbows and Prisms
* IA 9.1: Transverse Wave
 | Quick Check (p. 253) |
|  |
| Lesson 101 Exploration: Water Prism |
| 254 | 101.1 Create a water prism.101.2 Observe the effects of white light passing through the water.101.3 Draw conclusions about the light that passed through the water prism. | Activities* Exploration: Water Prism (pp. 243–44)

Assessments* Exploration Rubric

Materials* color wheel
* supplies for water prism exploration; see Activities p. 243 for materials
 |  | Exploration Rubric |
| Lesson 102 Reflection and Refraction |
| 255–58 | 102.1 Compare reflection and refraction.102.2 Explain why an object appears to be a certain color.102.3 Explain why an object in water may appear bent or broken.102.4 Identify tools that use refraction to help people see things more clearly. | Activities* Study Guide (pp. 245–46)

Assessments* Quiz 10B

Materials* supplies for “Cool” Light Patterns demonstration
 | Teacher Tools Online* WL: Understanding Absorption of Light—Why Do We See Different Colors?
* WL: Rainbows and Refraction
 | Quick Check (p. 258)Study Guide (Act. pp. 245–46)Quiz 10B |
| Lesson 103 Light and the Human Eye |
| 259–64 | 103.1 Identify the structures and functions of the human eye.103.2 Sequence how light travels through the eye to the optic nerve.103.3 Differentiate between normal vision, farsighted vision, and nearsighted vision.  BWS History of Nature (explain)103.4 Compare how light is refracted by concave and convex lenses.103.5 Explain why understanding refraction and lenses is beneficial. BWS Importance of Humans (explain) | Teacher Edition* IA 10.2: Parts of the Eye

Activities* Study Guide (pp. 247–48)

Assessments* Quiz 10C

Materials* 12 large sheets of white paper
 | Teacher Tools Online* Video: Ophthalmologist
* IA 10.2: Parts of the Eye
* WL: Nearsighted or Farsighted
* WL: Glasses and Vision
 | Quick Check (p. 261)Quick Check (p. 263)Study Guide (Act. pp. 247–48)Quiz 10C |
| Lessons 104–6 Exploration: I Spy My Eye |
| 265 | 104–6.1 Research the structures and functions of the human eye.104–6.2 Write a complete paragraph, using the research conducted, and include at least one interesting fact about a structure of the human eye and its function.104–6.3 Create a three-dimensional model of the eye.104–6.4 Present research about a structure of the human eye and its function, using the written paragraph and the model.104–6.5 Compare the human eye model to the human eye.  BWS Modeling in Science (explain) | Activities* Exploration: I Spy My Eye (pp. 249–50)

Assessments* Exploration Rubric

Materials* supplies for the human eye model exploration; see Activities p. 249 and Teacher Edition p. 265 for materials
 | Teacher Tools Online* WL: The Seeing Eye
 | Exploration Rubric |
| Lesson 107 Review |
| 240–65 | 107.1 Recall terms and concepts from Chapter 10. | Materials* supplies for review game
 |  |  |
| Lesson 108 Test |
|  | 108.1 Apply terms and concepts from Chapter 10. | Assessments* Test 10
 | Teacher Tools Online* EV: Chapter 10 Test Bank
 | Test 10EV: Chapter 10 Test Bank |

Chapter 11: Sound

| Pages | Objectives | Printed Resources & Materials | Digital resources | Assessments |
| --- | --- | --- | --- | --- |
| Lesson 109 Sound Waves |
| 266–72 | 109.1 Describe the properties of sound waves. | Materials* coiled spring toy
* pencil
 | Teacher Tools Online* Video: Sound
* WL: Cacophony of Sounds
 | Quick Check (p. 272) |
| Lesson 110 Characteristics of Sound |
| 273–76 | 110.1 Identify the characteristics of sound.110.2 Relate the pitch of a sound to its frequency.110.3 Relate the volume of a sound to its amplitude.110.4 Explain how timbre helps to distinguish sounds. | Activities* Study Guide (pp. 251–52)

Assessments* Quiz 11A

Materials* supplies for timbre demonstration
 | Teacher Tools Online* WL: Pitch: Super Sounding Drums
* WL: Timbre
 | Quick Check (p. 276)Study Guide (Act. pp. 251–52)Quiz 11A |
| Lesson 111 Sound and Matter |
| 277–81 | 111.1 Relate the speed of sound to the type of medium.111.2 Relate the speed of sound to the transfer of energy.111.3 Describe how temperature affects the speed of sound.111.4 Describe how reflection and absorption affect sound. | Activities* Study Guide (pp. 253–54)

Assessments* Quiz 11B

Materials* supplies for balloon demonstration
* supplies for particle demonstration
 | Teacher Tools Online* Video: Pediatric Echocardiography Sonographer
* WL: Echolocation
 | Quick Check (p. 280)Study Guide (Act. pp. 253–54)Quiz 11B |
| Lessons 112–13 STEM: Case of the Boxed-Up Sound |
| 282 | 112–13.1 Infer what shape, design, and materials work best to hear the sound.112–13.2 Design a model of a tool that will listen to a secret, recorded clue using the engineering design process.112–13.3 Create a tool that will hear the recorded clue.112–13.4 Test and compare models to improve the original design.112–13.5 Communicate how the design solves the problem. | Teacher Edition* IA 2.2: STEM: The Engineering Design Process

Activities* STEM: Case of the Boxed-Up Sound (pp. 255–57)

Assessments* STEM Rubric

Materials* see Teacher Edition p. 282 for materials
 | Teacher Tools Online* IA 2.2: STEM: The Engineering Design Process
 | STEM Rubric |
|  |
| Lesson 114 The Ear and Hearing |
| 283–88 | 114.1 Label the main parts of the ear.114.2 Relate the three main parts of the ear to the functions of each part of the ear.114.3 Sequence the path of sound waves through the ear to the brain. | Teacher Edition* IA 11.1: Diagram of the Human Ear

Materials* centimeter ruler
 | Teacher Tools Online* IA 11.1: Diagram of the Human Ear
* WL: Hearing: How Your Ears Work
* WL: Hearing Loss Simulation
* WL: How Cochlear Implants Work
 | Quick Check (p. 288) |
| Lesson 115 Exploration: All Ears |
| 289 | 115.1 Create a three-dimensional model of the ear.115.2 Infer how scientists named different parts of the ear.115.3 Compare and contrast the model of the human ear with the human ear.115.4 Communicate how the model of the ear helps to understand how the ear works. | Teacher Edition* IA 11.1: Diagram of the Human Ear

Activities* Exploration: All Ears (pp. 259–60)

Assessments* Exploration Rubric

Materials* supplies for creating a three-dimensional model of the ear; see Activities p. 259 for materials
 | Teacher Tools Online* IA 11.1: Diagram of the Human Ear
* WL: Parts of the Human Ear
 | Exploration Rubric |
| Lesson 116 Sound Communication |
| 290–95 | 116.1 Describe the history of information transfer.  BWS History of Nature (explain)116.2 Explain binary code.116.3 Sequence the transfer of information in digital communication. | Activities* Study Guide (pp. 261–62)

Assessments* Quiz 11C

Materials* paper bag
 | Teacher Tools Online* WL: Computer Science Basics: Binary
 | Quick Check (p. 292)Quick Check (p. 295)Study Guide (Act. pp. 261–62)Quiz 11C |
| Lessons 117–18 Exploration: Code in Binary |
| 296 | 117–18.1 Record three initials in binary code.117–18.2 Encode letters into binary code. | Teacher Edition* IA 11.2: Code Worksheet

Activities* Exploration: Code in Binary (pp. 263–65)

Assessments* Exploration Rubric

Materials* supplies for recording three initials in binary code; see Activities p. 263 for materials
* 3 containers
 | Teacher Tools OnlineIA 11.2: Code WorksheetWL: Binary Code | Exploration Rubric |
| Lesson 119–20 STEM: HELP! |
| 297 | 119–20.1 Design a model of a device that will communicate with light or sound over a distance using the engineering design process.119–20.2 Create a device that will communicate over a distance.119–20.3 Test and compare devices to improve the original design.119–20.4 Communicate how the design solves the problem. BWS Purpose of Science (explain) | Teacher Edition* IA 2.2: STEM: The Engineering Design Process

Activities* STEM: HELP! (pp. 267–69)

Assessments* STEM Rubric

Materials* see Teacher Edition p. 297 for materials
 | Teacher Tools Online* IA 2.2: STEM: The Engineering Design Process
* WL: Communication over Distance
 | STEM Rubric |
| Lesson 121 Review |
|  | 121.1 Recall terms and concepts from Chapter 11. |  |  |  |
| Lesson 122 Test |
|  | 122.1 Apply terms and concepts from Chapter 11. | Assessments* Test 11
 | Teacher Tools Online* EV: Chapter 11 Test Bank
 | Test 11EV: Chapter 11 Test Bank |

Chapter 12: The Earth’s Water

| Pages | Objectives | Printed Resources & Materials | Digital resources | Assessments |
| --- | --- | --- | --- | --- |
| Lessons 123–24 Fresh Water and Salt Water |
| 298–311 | 123–24.1 Identify the earth’s land and water proportions.123–24.2 Describe the continuous movement of water above and on the earth’s surface using the water cycle.123–24.3 Distinguish the properties and benefits of fresh water and salt water. | Teacher Edition* IA 12.1: My Father’s World
* IA 12.2: Frayer Model
* IA 12.3: Vocabulary 1
* IA 12.4: Vocabulary 2
* IA 12.5: Vocabulary 3
* IA 12.6: Water and Land
* IA 12.7: Ocean Saltiness

Activities* Raindrops Keep Falling (p. 271)

Materials* supplies for float or sink demonstration
* supplies for freezing salt water demonstration
 | Teacher Tools Online* Video: The Earth’s Waters
* Video: Water Treatment Plant Operator
* IA 12.1: My Father’s World
* IA 12.2: Frayer Model
* IA 12.3: Vocabulary 1
* IA 12.4: Vocabulary 2
* IA 12.5: Vocabulary 3
* IA 12.6: Water and Land
* IA 12.7: Ocean Saltiness
* WL: Earth
 | Quick Check (p. 307)Quick Check (p. 311) |
| Lesson 125 Water Conservation |
| 312–16 | 125.1 Identify reasons and ways to conserve the earth’s water. BWS Purpose of Science (explain) | Teacher Edition* IA 3.6: Be a Detective 1
* IA 3.7: Be a Detective 2
* IA 12.8: Vocabulary 4

Activities* Study Guide (pp. 273–76)

Assessments* Quiz 12A

Materials* hand lens
* sticky notes
* 3.8 L (1 gal) jug of water
* supplies for dripping water demonstration
 | Teacher Tools Online* IA 3.6: Be a Detective 1
* IA 3.7: Be a Detective 2
* IA 12.8: Vocabulary 4
* WL: Plastic Adrift
 | Quick Check (p. 316)Study Guide (Act. pp. 273–76)Quiz 12A |
|  |
| Lesson 126 Investigation: The Great Vapor Race |
| 317 | 126.1 Hypothesize how surface area affects the speed of water evaporation.126.2 Measure the weights of two containers of water before and after evaporation.126.3 Record and graph data.126.4 Identify the controlled and independent variables.126.5 Infer why knowing the effect of surface area on the speed of water evaporation is beneficial. BWS Purpose of Science (explain) | Activities* Investigation: The Great Vapor Race (pp. 277–79)

Assessments* Investigation Rubric

Materials* supplies for The Great Vapor Race Investigation; see Activities p. 277 for materials
* sheet of construction paper
* blue food coloring
 |  | Investigation Rubric |
| Lesson 127 Inquiry: The Great Vapor Race |
| 317 | 127.1 Hypothesize how air temperature or wind affects the speed of water evaporation. 127.2 Measure the weights of two containers of water before and after evaporation.127.3 Record and graph data.127.4 Identify the controlled and independent variables.127.5 Defend why knowing the effect of air temperature or wind on the speed of water evaporation is beneficial. BWS Purpose of Science (evaluate) | Activities* Investigation: The Great Vapor Race (pp. 277–79)
* Inquiry: The Great Vapor Race (pp. 281–83)

Assessments* Inquiry Rubric

Materials* supplies for The Great Vapor Race Inquiry; see Activities p. 281 for materials
* blue food coloring
 |  | Inquiry Rubric |
| Lessons 128–29 Ocean Waves and Energy Transfer |
| 318–23 | 128–29.1 Identify and locate the oceans.128–29.2 Explain how energy is transferred from wind to the ocean surface.128–29.3 Identify cause-and-effect relationships of energy and waves. | Teacher Edition* IA 12.6: Water and Land
* IA 12.8: Vocabulary 4
* IA 12.9: Vocabulary 5
* IA 12.10: Vocabulary 6
* IA 12.11: Frayer Model Key
* IA 12.12: Cause and Effect

Activities* Study Guide (pp. 285–87)

Assessments* Quiz 12B

Materials* word cards from Chapter 7
* globe or world map
* supplies for wave model
* dry-erase marker
 | Teacher Tools Online* IA 12.6: Water and Land
* IA 12.8: Vocabulary 4
* IA 12.9: Vocabulary 5
* IA 12.10: Vocabulary 6
* IA 12.11: Frayer Model Key
* IA 12.12: Cause and Effect
* WL: Surfing the Waves
* WL: Wave Origin
 | Quick Check (p. 321)Quick Check (p. 323)Quiz 12B |
|  |
| Lesson 130 Investigation: Making Waves |
| 324 | 130.1 Hypothesize how wind energy creates surface waves and how the energy transfer takes place in the ocean.130.2 Record data on the movement of water and marbles by wind energy.130.3 Identify the controlled and independent variables in the creation of waves.130.4 Infer why knowing how surface waves form and knowing about the energy transfer of wind are beneficial. BWS Purpose of Science (explain) | Activities* Investigation: Making Waves (pp. 289–92)

Assessments* Investigation Rubric

Materials* supplies for the Making Waves Investigation; see Activities p. 289 for materials
* globe
 |  | Investigation Rubric |
| Lessons 131–32 Ocean Currents |
| 325–30 | 131–32.1 Identify what causes surface currents. BWS History of Nature (explain)131–32.2 Identify the direction of flow of warm and cold currents.131–32.3 Classify the Gulf Stream, California Current, and Humboldt Current as warm or cold currents.131–32.4 Identify two things that influence deep ocean currents. | Teacher Edition* IA 12.10: Vocabulary 6
* IA 12.13: Ocean Currents
* IA 12.14: Friendly Floatees

Activities* Ocean Currents (p. 293)
* Study Guide (pp. 295–96)

Assessments* Quiz 12C

Materials* supplies for temperature and salinity demonstrations
* sticky notes
* globe
 | Teacher Tools Online* IA 12.10: Vocabulary 6
* IA 12.13: Ocean Currents
* IA 12.14: Friendly Floatees
 | Quick Check (p. 327)Quick Check (p. 330)Study Guide (Act. pp. 295–96)Quiz 12C |
| Lesson 133 Exploration: Go with the Flow |
| 331 | 133.1 Create a model of the ocean, surface objects, and wind.133.2 Record and interpret data.133.3 Relate the motion of surface currents to the motion of objects floating in the ocean.133.4 Relate the transfer of energy from wind to the movement of water.133.5 Infer how surface currents affect the ocean water. | Activities* Exploration: Go with the Flow (pp. 297–300)

Materials* supplies for Go with the Flow Exploration; see Activities p. 297 for materials
 | Teacher Tools Online* WL: Ocean Surface Currents
 |  |
| Lesson 134 Review |
|  | 134.1 Recall terms and concepts from Chapter 12. | Materials* game tokens
 |  |  |
|  |
| Lesson 135 Test |
|  | 135.1 Apply terms and concepts from Chapter 12. | Assessments* Test 12
 | Teacher Tools Online* EV: Chapter 12 Test Bank
 | Test 12EV: Chapter 12 Test Bank |

Chapter 13: Below the Ocean’s Surface

| Pages | Objectives | Printed Resources & Materials | Digital resources | Assessments |
| --- | --- | --- | --- | --- |
| Lesson 136 The Ocean Floor |
| 332–37 | 136.1 Identify features of the ocean floor.136.2 Compare and contrast the features of the ocean floor with features of the earth’s land. | Teacher Edition* IA 13.1: Ocean Floor

Activities* Ocean Features (p. 301)

Materials* supplies for whale demonstration
 | Teacher Tools Online* Video: Below the Ocean’s Surface
* IA 13.1: Ocean Floor
* WL: Leaf Sheep Sea Slug
* WL: Island Mountains
* WL: Challenger Deep
* WL: Mauna Kea
 | Quick Check (p. 337) |
| Lessons 137–38 Exploration: Mapping the Depths |
| 338 | 137–38.1 Create a model of the ocean floor with at least three features.137–38.2 Measure the depth of an ocean floor model.137–38.3 Graph the features of an ocean floor model.137–38.4 Communicate how the graph compared to the ocean floor model. BWS Modeling in Science (explain) | Activities* Exploration: Mapping the Depths (pp. 303–6)

Assessments* Exploration Rubric

Materials* supplies for ocean floor model; see Activities p. 303 for materials
 | Teacher Tools Online* WL: The Ocean Floor
 | Exploration Rubric |
| Lessons 139–40 The Sunlight Zone |
| 339–49 | 139–40.1 Describe the characteristics of the sunlight zone of the ocean.139–40.2 Classify ocean organisms in a food web as producers or consumers.139–40.3 Sequence the transfer of energy in an ocean food web.139–40.4 Construct a food chain to show the transfer of energy from the sun to the organisms in the ocean.139–40.5 Give examples of God’s design for organ­isms that help each other to survive and grow. BWS Design in Nature (explain) | Teacher Edition* IA 13.2: Ocean Zones

Activities* Ocean Zones (p. 307)
* Food Chains (pp. 309–10)
* Study Guide (pp. 311–14)

Assessments* Quiz 13A
 | Teacher Tools Online* Video: Underwater Photographer
* IA 13.2: Ocean Zones
* WL: Oceans: Sunlight Zone
* WL: Parrotfish
* WL: Carrier Crab
* WL: Blue Shark
* WL: Clownfish
 | Quick Check (p. 345)Quick Check (p. 348)Study Guide (Act. pp. 311–14)Quiz 13A |
| Lesson 141 The Twilight Zone |
| 350–53 | 141.1 Describe the characteristics of the twilight zone of the ocean.141.2 Identify ways that bioluminescence is a benefit to some organisms.141.3 Compare and contrast views of the origin of bioluminescence. BWS History of Nature (evaluate) | Teacher Edition* IA 13.2: Ocean Zones
* IA 13.3: Fish

Activities* Ocean Zones (p. 307)

Materials* small glow sticks
 | Teacher Tools Online* Video: Bioluminescence
* IA 13.2: Ocean Zones
* IA 13.3: Fish
* WL: Oceans: Twilight Zone
 | Quick Check (p. 353) |
| Lesson 142 The Dark Zone |
| 354–59 | 142.1 Describe the characteristics of the dark zone of the ocean.142.2 Explain how God designed some organisms to survive and grow in harsh environments. BWS Design in Nature (explain) | Teacher Edition* IA 13.2: Ocean Zones

Activities* Ocean Zones (p. 307)
* Study Guide (pp. 315–16)

Assessments* Quiz 13B

Materials* sticky notes
* supplies for water pressure demonstration
 | Teacher Tools Online* IA 13.2: Ocean Zones
* WL: Oceans: Dark Zone
* WL: Deepsea Challenger
* WL: Marine Snow
 | Quick Check (p. 359)Study Guide (Act. pp. 315–16) Quiz 13B |
| Lesson 143 Exploration: Ocean Zones |
| 360 | 143.1 Create a model of the zones of the ocean.143.2 Communicate facts about the ocean zones with others. | Activities* Exploration: Ocean Zones (pp. 317–18)
* Answers in Genesis: A Whale of a Tale (pp. 319–20)

Assessments* Exploration Rubric

Materials* supplies for ocean zone model; see Activities p. 317 for materials
 | Teacher Tools Online* WL: Whale Evolution
 | Exploration Rubric |
| Lessons 144–46 Exploration: Ocean Life |
| 361 | 144–46.1 Research an organism that lives in the ocean.144–46.2 Record information about that organism.144–46.3 Create a presentation about that organism.144–46.4 Communicate information about that organism. | Activities* Exploration: Ocean Life (pp. 321–22)

Assessments* Exploration Rubric

Materials* supplies for ocean life research; see Activities p. 321 for materials
 | Teacher Tools Online* Video: God’s Amazing Creatures
 | Exploration Rubric |
| Lesson 147 Review |
|  | 147.1 Recall terms and concepts from Chapter 13. | Teacher Edition* IA 13.4: Submersibles
 | Teacher Tools Online* IA 13.4: Submersibles
 |  |
| Lesson 148 Test |
|  | 148.1 Apply terms and concepts from Chapter 13. | Assessments* Test 13
 | Teacher Tools Online* EV: Chapter 13 Test Bank
 | Test 13EV: Chapter 13 Test Bank |

Chapter 14: The Earth’s Surface

| Pages | Objectives | Printed Resources & Materials | Digital resources | Assessments |
| --- | --- | --- | --- | --- |
| Lesson 149 Rocks and Minerals |
| 362–69 | 149.1 Recall the three main types of rocks and how they form. BWS History of Nature (recall)149.2 Identify organic materials.149.3 Explain why organic material can be found in some sedimentary rock. BWS History of Nature (explain)149.4 Relate minerals to rocks.149.5 Explain how the properties of minerals are used to differentiate one mineral from another. | Activities* Study Guide (pp. 323–24)

Assessments* Quiz 14A

Materials* rock
 | Teacher Tools Online* Video: The Earth’s Surface
* WL: Mohs Hardness Scale
 | Quick Check (p. 369)Study Guide (Act. pp. 323–24)Quiz 14A |
| Lesson 150 Weathering |
| 370–74 | 150.1 Explain how weathering affects the earth’s surface.150.2 Identify cause-and-effect relationships of physical and chemical weathering.150.3 Differentiate between physical weathering and chemical weathering. | Teacher Edition* IA: 14.1: Cause and Effect: Physical Weathering
* IA: 14.2: Cause and Effect: Chemical Weathering

Activities* Cause and Effect: Physical Weathering (p. 325)
* Cause and Effect: Chemical Weathering (p. 326)

Materials* supplies for expanding water demonstration
 | Teacher Tools Online* IA: 14.1: Cause and Effect: Physical Weathering
* IA: 14.2: Cause and Effect: Chemical Weathering
 | Quick Check (p. 374) |
| Lesson 151 Soil |
| 375–78 | 151.1 Identify the components of soil.151.2 Explain what determines soil texture.151.3 Differentiate between the three main layers of soil. | Activities* Study Guide (pp. 327–30)

Assessments* Quiz 14B

Materials* supplies for soil samples activity
 |  | Quick Check (p. 378)Study Guide (Act. pp. 327–30)Quiz 14B |
|  |
| Lesson 152 Exploration: Soil Detective |
| 379 | 152.1 Examine properties of three soil samples of an equal volume.152.2 Record and interpret data collected from each soil sample.152.3 Classify soil samples.152.4 Compare properties of soil samples. | Activities* Exploration: Soil Detective (pp. 331–35)

Assessments* Exploration Rubric

Materials* supplies for soil comparison exploration; see Activities p. 331 for materials
 |  | Exploration Rubric |
| Lesson 153 Investigation: Mystery of the Soil Samples |
| 380 | 153.1 Complete hypotheses to predict which soil sample will drain the most water and which soil sample will retain the most water.153.2 Measure the volume of water drained by each soil sample.153.3 Record and interpret data based on observations.153.4 Infer the ability of different soil samples to drain and retain water. | Activities* Investigation: Mystery of the Soil Samples (pp. 337–38)

Assessments* Investigation Rubric

Materials* supplies for soil sample investigation; see Activities p. 337 for materials
 |  | Investigation Rubric |
| Lesson 154 Erosion and Deposition |
| 381–85 | 154.1 Explain how water and wind erosion change the earth’s surface.154.2 Explain how the Genesis Flood helped to shape the earth’s surface.  BWS History of Nature (explain)154.3 Relate water and wind deposition to features on the earth’s surface. | Teacher Edition* IA: 14.3: Bending Rock Demonstration

Activities* Answers in Genesis: Bent Rock (pp. 339–40)

Materials* supplies for the bent rock demonstration
 | Teacher Tools Online* IA: 14.3: Bending Rock Demonstration
* Video: Bent Rock
* WL: Sea Stack Erosion
* WL: Rock Layers
* WL: Kosi River Course Shift
 | Quick Check (p. 383)Quick Check (p. 385) |
| Lesson 155 Investigation: Observing Erosion and Deposition |
| 386 | 155.1 Write a hypothesis to predict which type of soil will erode most easily.155.2 Identify and control the variables.155.3 Observe the erosion and deposition of three different types of soil.155.4 Draw conclusions about erosion anddeposition of soil types. | Activities* Investigation: Observing Erosion and Deposition (pp. 341–43)

Assessments* Investigation Rubric

Materials* drawing paper
* supplies for erosion and deposition investigation; see Activities p. 341 for materials
 |  | Investigation Rubric |
|  |
| Lesson 156 Erosion and Deposition |
| 387–90 | 156.1 Explain how glaciers create features on the earth’s surface.156.2 Evaluate different views of the origin of glaciers. BWS History of Nature (evaluate)156.3 Identify various landforms caused by glaciers.156.4 Compare a landslide and an avalanche.156.5 Evaluate the ways people’s activities relate to erosion. BWS Purpose of Science (evaluate) | Activities* Study Guide (pp. 345–47)

Assessments* Quiz 14C

Materials* sticky notes
* supplies for landslide demonstration
 | Teacher Tools Online* Video: Avalanches
* WL: Landslides
 | Quick Check (p. 390)Study Guide (Act. pp. 345–47)Quiz 14C |
| Lessons 157–58 Past and Present Changes to the Earth’s Surface |
| 391–98 | 157–58.1 Differentiate between a naturalistic view and a biblical view of rock layer and fossil formation. BWS History of Nature (evaluate)157–58.2 Evaluate, using a biblical worldview, the geologic time scale as a tool to determine the age of fossils. BWS History of Nature (evaluate)157–58.3 Identify ways the earth’s surface is presently changing.157–58.4 Relate the eruption of Mount St. Helens to the changes that occurred to the earth’s surface during the Genesis Flood. BWS History of Nature (formulate) | Teacher Edition* IA: 14.4: Geologic Time Scale

Materials* fossils or photos of fossils
 | Teacher Tools Online* IA: 14.4: Geologic Time Scale
* WL: The Fossil Record
* WL: Order of Fossils
* WL: Mount St. Helens
 | Quick Check (p. 392)Quick Check (p. 395)Quick Check (p. 398) |
| Lesson 159 Landforms |
| 399–404 | 159.1 Identify various landforms.159.2 Explain how movement of the earth’s surface shapes landforms.159.3 Identify types of maps used to identify and model landforms. | Activities* Study Guide (pp. 349–51)

Assessments* Quiz 14D

Materials* supplies for lava landform demonstration
 | Teacher Tools Online* Video: Cartographer
 | Quick Check (p. 403)Study Guide (Act. pp. 349–51)Quiz 14D |
|  |
| Lesson 160–61 Exploration: Continent X and Its Landforms |
| 405 | 160–61.1 Create a model of various landforms on an imaginary continent.160–61.2 Describe characteristics of each modeled landform. | Activities* Exploration: Continent X and Its Landforms (pp. 353–54)

Assessments* Exploration Rubric

Materials* supplies for the landform review
* supplies for continent and landform model; see Activities p. 353 for materials
 |  | Exploration Rubric |
| Lesson 162 Review |
| 362–405 | 162.1 Recall terms and concepts from Chapter 14. |  |  |  |
| Lesson 163 Test |
|  | 163.1 Apply terms and concepts from Chapter 14. | Assessments* Test 14
 | Teacher Tools Online* EV: Chapter 14 Test Bank
 | Test 14EV: Chapter 14 Test Bank |

Chapter 15: Natural Hazards

| Pages | Objectives | Printed Resources & Materials | Digital resources | Assessments |
| --- | --- | --- | --- | --- |
| Lesson 164 Earthquakes |
| 406–13 | 164.1 Relate Earth’s plates to the layers of the earth.164.2 Explain what causes earthquakes.164.3 Relate plate boundaries to earthquake activity using a map.164.4 Describe the benefits of studying earthquakes. BWS Importance of Humans (explain) | Teacher Edition* IA 15.1: Earth’s Layers
* IA 15.2: Earthquake Safety
* IA 15.3: Major Plate Boundaries and Faults

Activities* Earth’s Layers (p. 355)

Materials* meter stick, or tape measure
 | Teacher Tools Online* Video: Natural Hazards
* IA 15.1: Earth’s Layers
* IA 15.2: Earthquake Safety
* IA 15.3: Major Plate Boundaries and Faults
* WL: Earthquake Damage
* WL: Bridge Building Time Lapse
 | Quick Check (p. 413) |
| Lesson 165 Tsunamis and Floods |
| 414–19 | 165.1 Describe how tsunamis happen.165.2 Differentiate between local, regional, and worldwide flooding.165.3 Explain how we know that a worldwide flood will not happen again. BWS History of Nature (apply) | Teacher Edition* IA 15.3: Major Plate Boundaries and Faults
* IA 15.4: Tsunami
* IA 15.5: Flood Safety

Activities* Study Guide (pp. 357–60)

Assessments* Quiz 15A

Materials* sticky notes
 | Teacher Tools Online* IA 15.3: Major Plate Boundaries and Faults
* IA 15.4: Tsunami
* IA 15.5: Flood Safety
* WL: Tsunamis
* WL: Atlanta Flooding
* WL: Turn Around
 | Quick Check (p. 415)Quick Check (p. 419)Study Guide (Act. pp. 357–60)Quiz 15A |
| Lessons 166–67A STEM: Built to Last |
| 420 | 166–67A.1 Design a model of an earthquake-resistant bridge using the engineering design process.166–67A.2 Create a model of an earthquake-resistant bridge.166–67A.3 Test and compare models to improve the original design.166–67A.4 Communicate how the design solves the problem. BWS Importance of Humans (explain) | Teacher Edition* IA 2.2: STEM: The Engineering Design Process

Activities* STEM A: Built to Last (pp. 361–63)

Assessments* STEM Rubric

Materials* supplies for designing an earthquake-resistant bridge; see Teacher Edition p. 420 for suggested materials
 | Teacher Tools Online* IA 2.2: STEM: The Engineering Design Process
 | STEM Rubric |
|  |
| Lessons 166–67B STEM: Too Much Water! |
| 421 | 166–67B.1 Design a way to reduce the damage from flooding using the engineering design process.166–67B.2 Create a model of the design to reduce the impact of flooding.166–67B.3 Test and compare models to improve the original design.166–67B.4 Communicate how the design solves the problem. BWS Importance of Humans (explain) | Teacher Edition* IA 2.2: STEM: The Engineering Design Process

Activities* STEM B: Too Much Water! (pp. 365–67)

Assessments* STEM Rubric

Materials* supplies for designing a way to reduce flooding; see Teacher Edition p. 421 for suggested materials
 | Teacher Tools Online* IA 2.2: STEM: The Engineering Design Process
 | STEM Rubric |
| Lesson 168 Volcanoes |
| 422–26 | 168.1 Relate plate boundaries to volcanic eruptions.168.2 Locate the Ring of Fire, other volcanoes, and earthquakes by using a map.168.3 Identify patterns of earthquake and volcanic activity by using a map.168.4 Formulate ideas to limit the impact of a volcanic eruption on people. | Teacher Edition* IA 15.6: Earthquakes, Volcanoes, and Plate Boundaries

Activities* Study Guide (pp. 369–70)

Assessments* Quiz 15B

Materials* supplies for volcano demonstration
 | Teacher Tools Online* Video: Volcanologist
* IA 15.6: Earthquakes, Volcanoes, and Plate Boundaries
* WL: Whakaari Volcanic Eruption
 | Quick Check (p. 425)Study Guide (Act. pp. 369–70)Quiz 15B |
| Lesson 169 Exploration: Natural Hazards |
| 427 | 169.1 Create a poster that explains why it is important to study natural hazards. BWS Importance of Humans (formulate)169.2 Defend the idea that Christians should be concerned about limiting the effects of natural hazards. BWS Importance of Humans (formulate) | Activities* Exploration: Natural Hazards (pp. 371–72)

Assessments* Exploration Rubric
 | Teacher Tools Online* WL: Tsunami Preparedness
 | Exploration Rubric |
| Lesson 170 Review |
|  | 170.1 Recall terms and concepts from Chapter 15. | Teacher Edition* IA 15.7: Sandbags
 | Teacher Tools Online* IA 15.7: Sandbags
 |  |
| Lesson 171 Test |
|  | 171.1 Apply terms and concepts from Chapter 15. | Assessments* Test 15
 | Teacher Tools Online* EV: Chapter 15 Test Bank
 | Test 15EV: Chapter 15 Test Bank |

Chapter 16: Natural Resources

| Pages | Objectives | Printed Resources & Materials | Digital resources | Assessments |
| --- | --- | --- | --- | --- |
| Lesson 172 Resources for Our Use |
| 428–37 | 172.1 Identify what a natural resource is.  BWS Design in Nature (explain)172.2 Identify examples of a natural resource.172.3 Describe the benefits of renewable resources. BWS Importance of Humans (explain)172.4 Explain why it is beneficial to use renewable resources wisely. BWS Importance of Humans (formulate) | Materials* supplies for Lesson Introduction object lesson
 | Teacher Tools Online* Video: Natural Resources
* Video: Forester
* WL: Contour Plowing
 | Quick Check (p. 432)Quick Check (p. 437) |
| Lesson 173 Renewable and Nonrenewable Resources |
| 438–43 | 173.1 Identify renewable energy resources.173.2 Explain how people benefit from renewable energy resources.173.3 Differentiate between renewable and nonrenewable resources.173.4 Identify some of Earth’s nonrenewable resources.173.5 Explain, using a biblical worldview, how and when fossil fuels formed. BWS History of Nature (formulate) | Teacher Edition* IA 16.1: Energy Resources 1
* IA 16.2: Energy Resources 2

Activities* Energy Resources (pp. 373–74)
* Study Guide (pp. 375–77)

Assessments* Quiz 16A

Materials* solar-powered calculator
 | Teacher Tools Online* IA 16.1: Energy Resources 1
* IA 16.2: Energy Resources 2
* WL: Grand Coulee Dam
 | Quick Check (p. 441)Quick Check (p. 443)Study Guide (Act. pp. 375–77)Quiz 16A |
| Lesson 174 Exploration: Natural Resources All around Us |
| 444 | 174.1 Collect, record, and interpret data related to local natural resources.174.2 Observe natural resources in a local area.174.3 Classify the resources as renewable or nonrenewable.174.4 Create a natural resource map and key based on observations.174.5 Communicate the resources observed. | Activities* Exploration: Natural Resources All around Us (pp. 379–81)

Assessments* Exploration Rubric

Materials* supplies for natural resources exploration; see Activities p. 379 for materials
 |  | Exploration Rubric |
| Lesson 175 Our Responsibility |
| 445–51 | 175.1 Compare the advantages and disadvantages of renewable energy resources to nonrenewable energy resources.175.2 Evaluate the importance of conserving natural resources. BWS Purpose of Science (evaluate)175.3 Suggest ways to reduce, reuse, and recycle resources. BWS Purpose of Science (formulate) | Activities* Study Guide (pp. 383–85)

Assessments* Quiz 16B
 | Teacher Tools Online* Video: Mount Trashmore
* Video: Upcycling
 | Quick Check (p. 447)Quick Check (p. 451)Study Guide (Act. pp. 383–85)Quiz 16B |
| Lesson 176 Exploration: How Does Water Pollution Travel? |
| 452 | 176.1 Create a model of a watershed.176.2 Observe the flow of water in a watershed and the effect the flowing water has on land pollution.176.3 Draw conclusions about the importance of keeping watersheds clean. BWS Purpose of Science (explain)176.4 Make a recommendation for how land containing a watershed should be used. BWS Purpose of Science (apply) | Activities* Exploration: How Does Water Pollution Travel? (pp. 387–90)

Assessments* Exploration Rubric

Materials* supplies for water pollution exploration; see Activities p. 387 for materials
 | Teacher Tools Online* WL: What Is a Watershed?
 | Exploration Rubric |
| Lesson 177 Investigation: What Is in the Air I Breathe? |
| 453 | 177.1 Predict whether there are more particles in the air indoors or outdoors.177.2 Make a tool that will collect particles from the air.177.3 Record and interpret data from particles collected.177.4 Identify and control variables in the investigation.177.5 Draw conclusions about the importance of knowing how many particles are in the air. BWS Importance of Humans (apply) | Activities* Investigation: What Is in the Air I Breathe? (pp. 391–93)

Assessments* Investigation Rubric

Materials* supplies for air pollution investigation; see Activities p. 391 for materials
 |  | Investigation Rubric |
| Lesson 178 Science 4 Wrap-up |
| 454–55 | 178.1 Apply a biblical worldview to the course topics of living things, energy, motion, work, the earth, and the earth’s natural resources. BWS History of Nature, Design in Nature, Importance of Humans, Purpose of Science, Modeling in Science (apply) | Materials* representative item from one of the Science 4 units
* supplies for the reflection activity
 |  |  |
| Lesson 179 Review |
|  | 179.1 Recall terms and concepts from Chapter 16. | Materials* supplies for review game
 |  |  |
| Lesson 180 Test |
|  | 180.1 Apply terms and concepts from Chapter 16. | Assessments* Test 16
 | Teacher Tools Online* EV: Chapter 16 Test Bank
 | Test 16EV: Chapter 16 Test Bank |