Fourth Grade: FOSS
Life Science - Environments

Investigation Title and Synopsis	Concepts	Assessments and TE Page Numbers
1. Terrestrial Environments Students set up terrariums, observe them for 2 weeks, and describe the living and nonliving components (biotic and abiotic factors) that contribute to the terrarium environment.	• An environment is everything that surrounds and influences an organism • An environmental factor is one part of an environment. It can be living or nonliving • A relationship exists between environmental factors and how well organisms grow • Environments change over time	• Pretest (pages 361-364) • Part 1 Embedded Assessment: (pages 298-299) Science Notebook Sheet 1 *Terrarium Map* (page 229)/Teacher observation (page 298) • Part 2 Embedded Assessment: (pages 300-301) Science Notebook Sheet 2-Response Sheet *Terrestrial Environments* (page 230)
2. Isopods and Beetles Students investigate how isopods and beetles respond to environmental factors such as water and light. They study how plants depend on animals for survival (pollination and seed dispersal) and how animals depend on plants for food and shelter.	• Every organism has a set of preferred environmental conditions • Isopods prefer moist environments; beetles prefer dry environments • Isopods and beetles prefer dark environments. • Flowering plants produce seeds to make new plants • Pollination and seed dispersal are examples of how pants depend on animals • Animals depend on plants for food and shelter	• Embedded Assessment: /Teacher Observation: for Part 1 *Observing Organisms* (page 302) • Part 2 Embedded Assessment: (page 303) Science Notebook Sheet 4 *Isopods and Beetles* (page 232) • Part 3 Embedded Assessment: (pages 305-306) Science Notebook Sheet 5 *How Organisms Depend on One Another* (page 233) • Part 4 Embedded Assessment: (page 307) Designing Animal Investigations • Benchmark Assessment I-Check 1-2 (pages 365-367)
3. Aquatic Environments Students set up freshwater aquariums with fish and plants. They monitor the environmental factors in the systems and look for feeding interactions. They learn about the role of producers, consumers, and decomposers in food chains and webs.	• Aquatic environments include living and nonliving factors • The interaction of organisms with one another and with the nonliving environment is an ecosystem • Organisms interact in feeding relationships in ecosystems	• Part 1 Embedded Assessment: Teacher observation (pages 308-309) *Goldfish Aquariums* (page 308) • Part 2 Embedded Assessment: New Organisms (page 309) • Part 3 Embedded Assessment: Science Notebook Sheet 8 *Response Sheet Aquatic Environment* (page 236)

Investigation Title and Synopsis	Concepts	Assessments and TE Page Numbers
3. Aquatic Environments (cont'd)	• Producers (plants) make their own food; consumers eat plants and animals Decomposers eat dead plants and animals and recycle the raw materials • Organisms may compete for resources	• Part 4 Embedded Assessment: (pages 312-313)/ Science Notebook Sheet 9 Kelp Forest Food Web (pages 239) • Benchmark Assessment I-Check 3 (pages 369-370)
4. Brine Shrimp Hatching Students conduct a controlled experiment to determine which of four salt concentrations allow brine shrimp eggs to hatch. They determine range of tolerance and optimum conditions. They learn about a marine food web.	• Brine shrimp eggs can hatch in a range of salt concentrations, but more hatch in environments with optimum salt concentration • Organisms interact in feeding relationships in ecosystems • Producers (plants) make their own food; consumers eat plants and animals Decomposers eat dead plants and animals and recycle the raw materials • Most microorganisms do not cause disease, and many are beneficial	• Part 1 Embedded Assessment: *Setting up the Experiment* (page 314) • Part 2 Embedded Assessment: *Determining the Range of Tolerance* (page 315) • Part 3 Embedded Assessment: (pages 316-317) Science Notebook Sheet 14 Reponse Sheet Investigation 4 (page 242) • Benchmark Assessment I-Check 4 (pages 371-373)
5. Range of Tolerance Students set up and monitor experiments to determine the range of tolerance of water for germination of four kinds of seeds: corn, pea, barley, and radish. In a second experiment they test the effect of salinity on these seeds.	• Every organism has a range of tolerance for each factor in its environment • Organisms have specific requirements for successful growth, development and reproduction • Optimum conditions are those most favorable to an organism	• Part 1 Embedded Assessment: (pages 318-319)/ Science Notebook Sheet 15 *Plant Experiment Set-Up* (page 243)/Science Notebook Sheet 16 *Plant Observations* (page 244) • Part 2 Embedded Assessment: (pages 320-321)/ Science Notebook Sheet 18 Range of Tolerance (page 246) • Part 3 Embedded Assessment: Concluding the Module Performance Assessment (page 322) • Benchmark Assessment I-Check 5 (pages 374-375) • Posttest (pages 361-364)

Fourth Grade: FOSS
Earth Science - Solid Earth

Investigation Title and Synopsis	Concepts	Assessments and TE Page Numbers
1. Mock Rocks Students record observations of mock rocks. They take the rocks apart and sort ingredients. They place some rock material in water, evaporate the liquid, and identify the crystals that form. Students learn that rocks are made of minerals.	• Rocks have many properties, including shape, color, and texture • Rocks are made of ingredients called minerals; minerals are made of only one substance • Mineral crystals have identifiable shapes	• Pretest (pages 397-402) • Embedded Assessment: Teacher observation for Part 1 *Observing Mock Rocks* (page 332) • Part 2 Embedded Assessment: (pages 333-334) Science Notebook Sheet 5 Response Sheet-Mock Rocks (page 227) • Embedded Assessment: Teacher observation for Part 3, Observing Crystals (page 335) • Benchmark Assessment I-Check 1 (pages 403-404)
2. Scratch Test Students investigate four unknown minerals and use the property of hardness to make confident identification of the rock-forming minerals. Students learn one important diagnostic property of minerals.	• A mineral is an earth material that cannot be physically broken down any further • Hardness, a mineral property, is the resistance of a mineral to being scratched; minerals can be identified and seriated by hardness	• Part 1 Embedded Assessment: (pages 336-337) Science Notebook Sheet 7 *Scratch Test Minerals* (page 229) • Part 2 Embedded Assessment: (pages 338-339) Science Notebook Sheet 9 Reponse Sheet-Scratch Test (page 231) • Benchmark Assessment I-Check 2 (pages 405-406)
3. Calcite Quest Students investigate the mineral calcite and its special property of reacting in vinegar. They place four rock samples in vinegar and look for evidence that calcite is an ingredient. Students are introduced to common sedimentary and metamorphic rocks.	• Rocks are made of minerals • Calcite is one of the most common minerals on Earth • Sometimes more than one test is needed to provide conclusive evidence • Crystal patterns can help us identify certain minerals • Limestone and marble are two rocks that contain calcite	• Part 1 Embedded Assessment: (pages 340-341)/ Science Notebook Sheet 10 *Calcite Quest* (page 232) and Science Notebook Sheet 11 *Vinegar Test* (page 233) • Part 2 Embedded Assessment: (pages 342-343) Science Notebook Sheet 13 *Response Sheet Calcite Quest* (page 235) • Benchmark Assessment I-Check 3 (pages 407-408)

Investigation Title and Synopsis	Concepts	Assessments and TE Page Numbers
4. Take It For Granite Students investigate more mineral properties—streak and luster—and use a diagnostic table to identify several unknown minerals. Students are introduced to the rock cycle and the processes that form the three types of rocks.	• Rocks are made of ingredients called minerals. • Minerals can be identified by their properties (e.g. hardness, luster, streak, fizzing in acid) • The three basic rock types are igneous, sedimentary, and metamorphic • The rock cycle is a way to describe how the three types of rocks form from one another	• Part 1 Embedded Assessment: (pages 344-345)/ Science Notebook Sheet 18 *Response Sheet Take it for Granite C* (page 240) • Part 2 Embedded Assessment: (pages 346-347)/ Science Notebook Sheet 19 *Granite Minerals* (page 241) • Benchmark Assessment I-Check 4 (pages 409-410)
5. Landforms Students investigate chemical weathering by soaking limestone in vinegar, and physical weathering by shaking granite in a jar. They investigate erosion and deposition in a stream table. They learn about processes that cause rapid changes to Earth's surface—earthquakes, volcanism, landslides, and floods.	• Chemical weathering of rock changes minerals into different minerals • Physical weathering breaks rocks into smaller particles by physical forces • Erosion wears away and transports earth materials by water, wind, or ice; deposition relocates eroded earth materials • Volcanoes, earthquakes, and landslides contribute to rapid changes in landform	• Part 1 Embedded Assessment: (pages 348-349)/ Science Notebook Sheet 21 *Rocks in Acid Rain* (page 243)/Science Notebook Sheet 22 *Acid Rain Evaporation* (page 244) • Part 2 Embedded Assessment: (page 350) Erosion • Part 3 Embedded Assessment: (page 351) Deposition • Part 4 Embedded Assessment: (pages 352-353) Science Notebook Sheet 24 *Stream Table Observations* (page 246) • Part 5 Embedded Assessment: (page 354) Investigation and Experimentation • Benchmark Assessment I-Check 5 (pages 411-414) • Posttest (pages 397- 402)

Fourth Grade: FOSS
Physical Science - Magnetism and Electricity

Investigation Title and Synopsis	Concepts	Assessments and TE page numbers
1. The Force Students investigate the properties of magnets. They construct a simple compass and use it to detect magnetic effects. They investigate the strength of the force of attraction by graphing data to look for patterns of interaction.	• Only iron sticks to a magnet • Magnetism can be induced in iron • Magnets have two poles. Like poles repel; opposite poles attract • Magnets display forces of attractions and repulsion that decrease with distance • A compass is a magnet used to detect magnetic fields, including the Earth's	• Pretest (pages 415-418) • Part 1 Embedded Assessment: (pages 336-337)/ Science Notebook Sheet 1 *Magnets and Objects* (page 231)/Science Notebook Sheet 2 *Detecting Iron* (page 232) • Part 1 Embedded Assessment: continued (pages 338-339)/Science Notebook Sheet 4 *When Magnet Meets Magnet* (page 234) • Part 2 Embedded Assessment: (pages 340-341)/ Science Notebook Sheet 6 *The Force* (page 236) • Part 4 Embedded Assessment: (pages 344-345)/ Science Notebook Sheet 7 *Detecting Magnets* (page 237) • Benchmark Assessment I-Check 1 (pages 419-424)
2. Making Connections Students investigate current electricity and circuits, the pathways through which electricity flows. They observe electric energy being converted to heat, light, and motion. They work with electrically charged objects and observe their behavior.	• A circuit is a pathway on which electric current flows • Lightbulbs convert electric energy into heat and light energy • Motors convert electric energy into motion energy when placed in a closed circuit • Conductors complete circuits and allow the flow of electric current; insulators do not	• Part 1 Embedded Assessment: continued (pages 346-347)/Science Notebook Sheet 8 *Charge* (page 238) • Part 2 Embedded Assessment: (pages 348-349)/ Science Notebook Sheet 9 *Lighting Bulbs* (page 239) • Part 3 Embedded Assessment: (pages 350-351)/ Science Notebook Sheet 11 *Response Sheet Making Connections* (page 241) • Part 4 Embedded Assessment: (pages 352-353)/ Science Notebook Sheet 12 *Conductors and Insulators* (page 242) • Part 5 Embedded Assessment: (pages 354-355)/ Science Notebook Sheet 13 *Mystery Boards* (page 243) • Benchmark Assessment I-Check 2 (pages 425-427)

Investigation Title and Synopsis	Concepts	Assessments and TE Page Numbers
3. Advanced Connections Students explore series and parallel circuits and compare the functioning of the components in each circuit. They formulate and justify their predictions, based on their observations of electric energy being converted to light and motion.	• A circuit with only one pathway for current flow is a series circuit. Components "share" the electric energy • A circuit with two or more pathways for current flow is a parallel circuit	• Part 1 Embedded Assessment: (pages 356-357)/ Science Notebook Sheet 15 *Two Bulbs in Series* (page 245) • Part 2 Embedded Assessment: (pages 358-359)/ Science Notebook Sheet 19 *Response Sheet-Advanced Connections* (page 249) • Part 3 Embedded Assessment: (pages 360-361)/ Science Notebook Sheet 20 *Reccommendation to the Board* (page 250) • Benchmark Assessment I-Check 3 (pages 428-432)
4. Current Attractions Students learn how to use electricity to make an electromagnet. They explore the variables that influence the strength of the magnetism produced by their electromagnets.	• A core of iron or steel becomes an electromagnet when electricity flows through a coil of insulated wire surrounding the core • There are many ways to change the strength of an electromagnet, including changing the number of winds of wire around the core	• Part 1 Embedded Assessment: Building an Electromagnet (page 362) • Part 2 Embedded Assessment: (pages 363-365) Science Notebook Sheet 21 *Winding Electromagnets* (page 251) /Science Notebook Sheet 22 *Response Sheet Current Attractions* (page 252) • Part 3 Embedded Assessment: More Electromagnets (page 366) • Benchmark Assessment I-Check 4 (pages 433-434)
5. Click It Students use all the concepts they have learned to build a simple telegraph system. The last part of the investigation asks students to use their inquiry skills to design, conduct, and report their own investigations.	• A telegraph is an electronic communication device that uses an electromagnet • A code is a symbolic system used for communication • A telegraph converts electric energy into motion and sound energy	• Part 1 Embedded Assessment: (pages 367) *Reinventing the Telegraph* (page 324) • Part 2 Embedded Assessment: (pages 368-369)/ Science Notebook Sheet 27 *Long Distance Telegraph* (page 257) • Part 3 Embedded Assessment: (pages 370-371)/ Science Notebook Sheet 29 (page 259) • Posttest (pages 415-418)