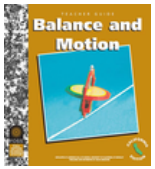
Second Grade: FOSS
Life Science - Insects and Plants

Investigation Title and Synopsis	Concepts	Assessments and TE Page Numbers
1. Mealworms Each student receives two larval mealworms in a vial to care and observe. Over 10 weeks students observe the larvae grow, molt, pupate, and turn into beetles, which mate, lay eggs, and die. They read two articles about insects in the environments.	• Insects need air, food, water, and space; environment affects growth • Insects have characteristic structures and behaviors; some are inherited from parents • The life cycle of the beetle is egg, larva, pupa, and adult, which produces egg	• Part 1: Anecdotal Notes (page 285) • Part 2: Teacher Observation: Draws and writes observations/Assessment Checklist (pages 286-289)/Notebook Sheet 2: *Insect Record* (page 224) • Part 3: Notebook Sheet 2: Teacher Observation: Draws and writes observations/Understands the mealworm life cycle/Assessment Checklist (pages 286-289)/Notebook Sheet 2: *Insect Record* (page 224)
2. Brassica Seeds Each student plants tiny rapid-cycling brassica seeds in a planter cup. The brassica plants grow under continuous light and develop for a month. Students observe and record the complete life cycle from seed to seed. They read about flowers and seeds.	• Seeds need water, light, air, and nutrients to grow and develop • As plants grow, they develop roots, stems, leaves, buds, flowers, and seeds in a sequence called life cycle • Environment affects growth	• Part 1: Anecdotal Notes (page 285) • Part 2: Anecdotal Notes (page 285) • Part 3: Teacher Observation: Makes good observations and recordings/Assessment Checklist (pages 286-289)/Notebook Sheet 5: *Plant Picture* (page 227)
3. Milkweed Bugs Groups of students receive vials of milkweed bug eggs. Each group prepares a habitat for the bugs, providing air, space, food, and water. They observe structure, pattern and behavior as the insects advance through simple metamorphosis. They read two articles about insect variation, shape, and color.	• Insects have three body parts: head, thorax, and abdomen • Insects have different structures for eating different kinds of food • Some insects go through simple metamorphosis (egg, nymph, adult) • Offspring resemble parents • There is variation in a population	• Part 1: Anecdotal Notes (page 285) • Part 2: Teacher Observation: Draws and labels milkweed bug habitats to show what insects need to survive/Assessment Checklist (pages 286-289)/Notebook Sheet 9: *Milkweed Bug Habitat* (page 231) • Part 3: Teacher Observation: Sequences the stages of an imaginary insect as it progresses through simple metamorphosis/ Assessment Checklist (pages 286-289)/ Notebook Sheet 11: *Life Cycle of the Triangle Bug* (page 233)

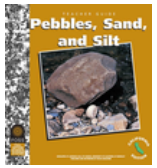
Investigation Title and Synopsis	Concepts	Assessments and TE Page Numbers
4. Silkworms Students observe the life history of one of the most commercially successful insects. They start with eggs and observe the growth and changes to larvae, pupae, and adults who produce eggs. Students study the structure of a moth larva, and read two articles about insects.	• Insect larvae have characteristic structures • Insect adults have characteristic structures • Male and female insects mate. The life cycle of silkworms is egg, larva, pupa, and adult, which produces eggs	• Part 1: Anecdotal notes (page 285) • Part 2: Teacher Observation: Observes, describes, and compares in detail, and uses new vocabulary/Assessment Checklist (pages 286-289)/Notebook Sheet 2: *Insect Record* (page 224) • Part 3: Anecdotal notes (page 285) • Part 4: Teacher Observation: Makes model that shows silkworm structures/Assessment Checklist (pages 286-289) • Part 5: Notebook Sheet 13: *Life of the Silkworm* (page 235)
5. Butterflies The class observes the painted lady larvae grow, pupate, and emerge as adults. Students experience the stages of complete metamorphosis and compare the behaviors of moths and butterflies. They read about life cycles of other animals and compare to insects.	• Insect larvae and adults have structures in common • The life cycle of the butterfly is egg, larva, pupa, and adult, which produces eggs • There are similarities and differences in the life cycles of different kinds of animals	• Part 1: Teacher Observation: Predicts how larvae will develop/Assessment Checklist (pages 286-289) • Part 2: Anecdotal Notes (page 285) • Part 3: Notebook Sheet 17: Sequences the life-cycle stages of an imaginary moth. *Life Cycle of the Square Moth* (page 239) • End-of-Module Assessment (pages 290-298)



Second Grade: FOSS
Physical Science - Balance and Motion

Investigation Title and Synopsis	Concepts	Assessments and TE Page Numbers
1. The First Straw Students learn the need for standard units of linear measurement. They measure objects with nonstandard units (straws), and then use a meter tape to measure objects in meters and centimeters. Later they apply linear metric measures to study motion.	• The meter is the standard metric unit of linear measurement; 100 centimeters makes a meter • Length is how far it is from one point to another	• Part 1: Anecdotal Notes (page 265) • Part 2: Teacher Observation: Assess students' techniques using meter tapes/Assessment Checklist (pages 266-269)/Notebook Sheet 1: *How Long Is It?* (page 213) • Part 3: Teacher Observation: Makes accurate measurements of length/Assessment Checklist (pages 266-269) and Notebook Sheet 2: *Making Comparisons* (page 214)
2. Balance Students explore numerous ways to balance two-dimensional shapes made out of tagboard by positioning counterweights in strategic locations. They make mobiles to apply their understanding of a stable position.	• Objects can be balanced in many ways • A stable position is one that is steady; the object is not falling over • Counterweights positioned in certain ways can help balance an object • A mobile is a system of balanced beams and objects	• Part 1: Anecdotal Notes (page 265) • Part 2: Notebook Sheet 3: *Stable Positions* (page 215) • Part 3: Teacher Observation: Describes position of counterweights; they must be below the balance point to produce a stable position/ Assessment Checklist (pages 266-269) • Part 4: Anecdotal Notes (page 265)

Investigation Title and Synopsis	Concepts	Assessments and TE Page Numbers
3. Spinners Students explore the variables that influence the spinning of a top, a zoomer, and twirlers. They explore the forces that make tops and zoomers move. They observe the force of gravity causing objects to fall.	• A force is a push or pull; gravity is a pulling force • Objects and systems that turn on a central axis exhibit rotational motion • The amount and position of mass affect how an object rotates • The motion of an object can be changed by pushing or pulling	• Part 1: Teacher Observation: Understand that speed and mass can affect how an object spins/ Assessment Checklist (pages 266-269) • Part 2: Anecdotal Notes (page 265) • Part 3: Teacher Observation: Compares spinners and knows that a force is needed to start the motion/Assessment Checklist (pages 266-269)
4. Rollers Students investigate rolling objects - wheels, cups, spheres - and describe change in position over time. They gain more experience with gravity causing objects to fall to the ground. Students use flexible marble runways to observe an object's change of position.	• Wheels and spheres roll down a slope because of gravity • Wheel-and-axle systems with wheels of different sizes roll toward the smaller wheel • The amount and location of mass can change the way a system rolls	• Part 1: Anecdotal Notes (page 265) • Part 2: Teacher Observation: Predicts and describes cups rolling down slopes/Assessment Checklist (pages 266-269) • Part 3: Notebook Sheet 8: *Marble Runways* (page 220)
5. Back and Forth Students explore the production of sound with a door fiddle, tuning forks, xylophones, kalimbas, spoons, and gongs. Students look for vibrations at the sound source and explore how to change pitch and volume of sound.	• Sound is caused by vibrations • Pitch is how high or low a sound is; differences in pitch are caused by differences in the rate at which objects vibrate • Volume is how loud or soft a sound is	• Part 1: Teacher Observation:s: Identifies a vibrating object as a sound source/Assessment Checklist (pages 266-269) • Part 2: Notebook Sheet 9: *The Xylophone* (page 221) and Notebook Sheet 10: *The Kalimba* (page 222)
6. Magnets and Tools Students work with magnets and find that two magnets will either attract or repel one another, depending on their orientation. They read about and view a video on how tools and machines make things move.	• Two magnets attract or repel when they come together • The magnetic force (push or pull) acts through space and most materials • Tools and machines can apply forces to make things move	• Part 1: Teacher Observation: Identifies and articulates force acting to move objects without touching them/Assessment Checklist (pages 266-269) • Part 2: Notebook Sheet 13: *Tools and Machines* Review (page 255) • End-of-Module Assessment (pages 290-298)



Second Grade: FOSS
Earth Science - Pebbles, Sand, and Silt

Investigation Title and Synopsis	Concepts	Assessments and TE Page Numbers
1. First Rocks Students are introduced to the mineral portion of Earth. They investigate several kinds of rocks and begin to understand the properties of rocks and describe rocks based on their physical properties. Students rub rocks, wash rocks, sort rocks, and describe rocks. They also begin to organize a class rock collection. Through two readings, students learn about the properties of rocks and the colorful minerals they contain.	• Rocks have a variety of properties color, hardness, shape, texture, and size • Rocks can be sorted by their properties • Rocks are all around us • Rocks are the solid material of the earth • Rocks are made of minerals	• Part 1: Anecdotal Notes (page 239) • Part 2: Notebook Sheet 2 *Rock Record* (page 191) • Part 3: Anecdotal Notes (page 239) • Part 4: Teacher Observation: Demonstrates good sorting skills/ Assessment Checklist (pages 240-243) • Part 5: Anecdotal Notes (page 239)
2. River Rocks Students investigate a river rock mixture of earth materials of different sizes. They separate the rocks, using a series of three screens to identify five sizes of rocks: large pebbles, small pebbles, large gravel, small gravel, and sand. They add water to a vial of sand to discover silt and clay. Students learn how sand is formed by reading the Story of Sand.	• Rocks can be categorized by size • Screens and water can be used to sort the sizes of earth materials • Five sizes of rocks, from smallest to largest, are clay, silt, sand, gravel, and pebbles	• Part 1: Teacher Observation: Observes and seriates rocks based on the property of size/Uses appropriate vocabulary/Assessment Checklist (pages 240-243)/Notebook Sheet 2 *Rock Words* (page 192) and Notebook Sheet 4 *Create a Graph* (page 194) • Part 2: Teacher Observation: Observes and sorts material based on size/Assessment Checklist (pages 240-243)/Notebook Sheet 5 *Sand, Gravel, and Pebbles* (page 195) and Notebook Sheet 6 *How Many Grams?* (page 196) • Part 3: Notebook Sheet 8: *Sand and Water Drawing?* (page 198) • Part 4: Notebook Sheet 11 *Bottle Drawing* (page 201) Teacher Observation: Observes and compares results of earth materials in water/ Assessment Checklist (pages 240-243)

Investigation Title and Synopsis	Concepts	Assessments and TE Page Numbers
3. Using Rocks Students learn how people use earth materials to construct objects. They make rubbings from sandpaper, sculptures from sand, decorative jewelry from clay, and bricks from clay soil. Students find places where people have used earth materials in building materials. They also read two articles about how rocks move, and how people use large rocks, gravel, sand, and clay to build things.	• Earth materials are natural resources • The properties of different earth materials make each suitable for specific uses • Earth materials can be used in a variety of structures	• Part 1: Anecdotal Notes (page 239) • Part 2: Anecdotal Notes (page 239) • Part 3: Anecdotal Notes (page 239) • Part 4: Anecdotal Notes (page 239) • Part 5: Notebook Sheet Uses of Earth Materials (page 202)
4. Soil Explorations Students put together and take apart soils. They are introduced to humus as an ingredient in soil. They compare homemade and local soils for texture, water retention capacity, color, and components. Through a video, students learn about what fossils tell us about Earth's past. Through readings, students learn more about soil, why soil is important for plants, and a famous dinosaur fossil.	• Soil is a mixture of earth materials • Soils vary from place to place • Soils have properties of color and texture • Soils differ from their abilities to support plants and retain water • Soils can be composed of humus and different amounts and sizes of rocks • Fossils are the remains of plants and animals that lived long ago	• Part 1: Teacher Observation: Uses plates, screen, and vials for separating soil/ Assessment Checklist (pages 240-243) • Part 2: Teacher Observation: Uses metric measuring tools/Assessment Checklist (pages 240-243)/Notebook Sheet15 *Water and Soil* (page 205) • Part 3: Anecdotal Notes (page 239) • Part 4: Notebook Sheet 14 *Soil Drawings* (page 204) • Part 5: Notebook Sheet 17 Fossils Review (page 207) • End-of-Module Assessment (pages 290-298)