***Ecosystems***

***Lesson One – Thinking about Ecosystems***

**GRADE LEVEL EXPECTATION**: Science 4 – Strand 4 – Changes in Ecosystems and Interactions of Organisms with their Environments concept A – All populations living together within a community interact with their environment in order to survive and maintain a balanced ecosystem. 4 – a Identify the ways a specific organism may interact with other organisms or with the environment ( e.g. pollination, shelter, seed dispersal, camouflage, migration, hibernation, defensive mechanism) b – Identify and describe different environments (i.e. pond, forest, prairie) support the life of different types of plants and animals

**Depth of Knowledge**: 1

**Objective**: Students set up their science notebooks, which they will use to record ideas and observations throughout the unit.

Students record and discuss their thoughts about how living things depend on each other.

Students discuss what they would like to find out about how living things depend on each other.

Students observe and discuss a riverbank environment.

**Learning Method**: Whole group

**Materials:** Science notebook, riverbank environment handout

**Learning Activities**:

Students create science notebook with title page, table of contents, lesson sheet.

Color riverbank environment handout.

Create a chart listing living and nonliving things.

Discuss the different kind of relationships illustrated in the picture.

**Assessment**: Science Notebook

***Lesson 2 – Setting Up the Terrarium***

**GRADE LEVEL EXPECTATION**: Science 4 – Strand 4 – Changes in Ecosystems and Interactions of Organisms with their Environments 1. Organisms are interdependent with one another and with their environment. Concept A – All populations living together within a community interact with their environment in order to survive and maintain a balanced ecosystem. 4 – a Identify the ways a specific organism may interact with other organisms or with the environment ( e.g. pollination, shelter, seed dispersal, camouflage, migration, hibernation, defensive mechanism) b – Identify and describe different environments (i.e. pond, forest, prairie) support the life of different types of plants and animals

**Depth of Knowledge**: 1

**Objective**: Students share what they know about a terrestrial environment.

Students think about the aquaria and terraria as models of environments.

Students set up their terraria.

Students make detailed records about the items they have placed in the terraria.

Students predict what will happen in their terraria in the next week.

**Learning Method**: Small groups

**Materials:** Science notebooks, bottle pieces, soil, fiberglass screen, rubber band, spoon, water, dropper, gravel, seeds: grass, alfalfa, mustard; toothpicks, hand lens, marker, leaf matter, small rock, twigs, record sheet 2-A

**Learning Activities**:

Discuss questions on page 40 about organisms.

Review instructions on building terrarium. Use record sheet 2-A for recordkeeping.

Students should work at their own pace setting up terrariums.

**Assessment**: Science Notebook

***Lesson 3 – Setting Up the Aquarium***

**GRADE LEVEL EXPECTATION**: Science 4 – Strand 4 – Changes in Ecosystems and Interactions of Organisms with their Environments 1. Organisms are interdependent with one another and with their environment. Concept A – All populations living together within a community interact with their environment in order to survive and maintain a balanced ecosystem. 4 – a Identify the ways a specific organism may interact with other organisms or with the environment ( e.g. pollination, shelter, seed dispersal, camouflage, migration, hibernation, defensive mechanism) b – Identify and describe different environments (i.e. pond, forest, prairie) support the life of different types of plants and animals

**Depth of Knowledge**: 1

**Objective**: Students discuss the needs of organisms in an aquatic environment.

Students set up their aquaria by adding gravel, water, elodea, duckweed, and algae.

Students read about the role of plants and algae in a pond.

**Learning Method**: Small groups

**Materials:** Science notebooks, Record Sheet 3A, Terrarium, Bottle part A, water, clear plastic cups, gravel, paper towels, elodea, duckweed plants, algae, dropper, hand lens, spoon, metric ruler

**Learning Activities**:

Students observe with a hand lens and record changes on their terraria using the observation sheet.

Discuss the question “What do aquatic organisms need?”

Review the instructions for setting up the aquarium on page 16 of the student book.

Students set up aquarium and use record sheet 3A to record the data.

Read page 17 “Duckweed, Elodea, and Algae: Why are They Important?”

**Assessment**: Science Notebook

***Lesson Four – Adding Animals to the Aquarium***

**GRADE LEVEL EXPECTATION**: Science 4 – Strand 4 – Changes in Ecosystems and Interactions of Organisms with their Environments 1. Organisms are interdependent with one another and with their environment. Concept A – All populations living together within a community interact with their environment in order to survive and maintain a balanced ecosystem. 4 – a Identify the ways a specific organism may interact with other organisms or with the environment ( e.g. pollination, shelter, seed dispersal, camouflage, migration, hibernation, defensive mechanism) b – Identify and describe different environments (i.e. pond, forest, prairie) support the life of different types of plants and animals

**Depth of Knowledge**: 1

**Objective**: Students discuss information on aquatic plants and algae gained through observation and reading.

Students complete their aquaria by adding mosquito fish and snails.

Students continue to record their observations of the plants, algae, and animals in their aquaria and the plants in their terraria.

Students read to learn more about the animals in their aquaria.

**Learning Method**: Small Group

**Materials:** Science notebook, Record Sheet 4-A: Aquarium Observations, 1 terrarium, 1 aquarium, 2 medium-sized pond snails, 2 mosquito fish, 1 hand lens, 1 spoon, 1 plastic cup, 1 dropper, 1 metric ruler

**Learning Activities**:

Students observe with a hand lens and record changes on their terraria using the observation sheet.

Discuss questions about the role of plants and algae in an aquarium.

Review the instructions for adding animals to the aquarium on page 24-25 of the student book.

Students add animals to aquariums and use Record Sheet 4-A to record observations.

Discuss final questions including the idea of interdependence and ecosystem.

Read page 26-27 “Mosquito Fish: Strong Little Fish” and page 28 “Snails: A Head at the End of a Foot”

**Assessment**: Science Notebook

***Lesson 5- Observing the Completed Aquarium***

**GRADE LEVEL EXPECTATION**: Science 4 – Strand 4 – Changes in Ecosystems and Interactions of Organisms with their Environments 1. Organisms are interdependent with one another and with their environment. Concept A – All populations living together within a community interact with their environment in order to survive and maintain a balanced ecosystem. 4 – a Identify the ways a specific organism may interact with other organisms or with the environment ( e.g. pollination, shelter, seed dispersal, camouflage, migration, hibernation, defensive mechanism) b – Identify and describe different environments (i.e. pond, forest, prairie) support the life of different types of plants and animals

**Depth of Knowledge**: 1

**Objective**: Students discuss what they have read and observed about the animals in their aquaria.

Students offer evidence of the dependent and interdependent relationships they have observed in their own ecosystems.

Students predict what changes might occur in both their own aquaria and terraria.

Students read about germination.

**Learning Method**: Small Group

**Materials:** Science notebook, 1 aquarium, 1 hand lens

**Learning Activities**:

Students observe with a hand lens and record changes on their aquaria using the observation sheet.

Discuss student observations about the relationships in their aquaria using a web. Create arrows to show relationship interdependence.

Students respond to the question “What would happen to your ecosystem if all the plants in it died?”

Students read page 31 “Growing Plants: How Seeds Spring to Life”

**Assessment**: Science Notebook

***Lesson 6 – Adding Animals to the Terrarium***

**GRADE LEVEL EXPECTATION**: Science 4 – Strand 4 – Changes in Ecosystems and Interactions of Organisms with their Environments 1. Organisms are interdependent with one another and with their environment. Concept A – All populations living together within a community interact with their environment in order to survive and maintain a balanced ecosystem. 4 – a Identify the ways a specific organism may interact with other organisms or with the environment ( e.g. pollination, shelter, seed dispersal, camouflage, migration, hibernation, defensive mechanism) b – Identify and describe different environments (i.e. pond, forest, prairie) support the life of different types of plants and animals

**Depth of Knowledge**: 1

**Objective**: Students continue to observe and record plant growth in the terraria.

Students make observations and record descriptions of the animals they add to their terria.

Students identify and record similarities and differences between crickets and isopods.

Students will learn more about crickets and isopods through reading selections.

**Learning Method**: Small Group

**Materials:** Science notebooks, Record Sheet 6-A: Adding Crickets and Isopods, 1 terrarium, 1 hand lens, 2 crickets, 2 isopods, 2 plastic cups, 2 index cards, 2 spoons, 1 metric ruler

**Learning Activities**:

Students observe with a hand lens and record changes on their terraria using the observation sheet.

Students share observations and discuss seed germination.

Create a VENN diagram comparing aquarium plants and terrarium plants

Review the instructions for adding animals to the terraria on page 36-37 in the student book.

Students add animals and use record sheet 6-A to record the data.

As a class, compare crickets and isopods.

Compare the land and water ecosystems.

Read page 38 “Isopods: More Like a Lobster!” and pages 39-40 “Crickets: A Closer Look”

**Assessment**: Science Notebook

***Lesson***

**GRADE LEVEL EXPECTATION**:

**Depth of Knowledge**:

**Objective**:

**Learning Method**:

**Materials:**

**Learning Activities**:

**Assessment**: Science Notebook

***Lesson***

**GRADE LEVEL EXPECTATION**:

**Depth of Knowledge**:

**Objective**:

**Learning Method**:

**Materials:**

**Learning Activities**:

**Assessment**: Science Notebook

***Lesson***

**GRADE LEVEL EXPECTATION**:

**Depth of Knowledge**:

**Objective**:

**Learning Method**:

**Materials:**

**Learning Activities**:

**Assessment**: Science Notebook