

Lesson 1: Introduction to a Riparian Zone

Lesson Summary

Students will be introduced to the functions of a riparian zone ecosystem and brainstorm ideas for creating a riparian zone model that they will build upon it throughout the unit.

Materials

- Riverwebs Video

Key Vocabulary

-Ecosystem -Riparian zone -Deciduous -Niche
-Nutrients -Water quality -Coniferous -Prey
-Microhabitats -Invertebrate -Predator

Next Generation Science Standards:

Performance Expectations: 5-LS2-1 Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.	Disciplinary Core Ideas: 5-LS2.A: Interdependent Relationships in Ecosystems LS2.B: Cycles of Matter and Energy Transfer in Ecosystems
Performance Expectations: Developing and Using Models Modeling in 3–5 builds on K–2 models and progresses to building and revising simple models and using models to represent events and design solutions. <ul style="list-style-type: none">• Develop a model to describe phenomena.	Cross Cutting Concepts: Systems and System Models <ul style="list-style-type: none">• A system can be described in terms of its components and their interactions.

Teacher Background Information:

A riparian zone is the interface between land and a river, or stream. It is often considered to be the first 100ft from a stream, but this may vary. A riparian zone is a specific ecosystem that provides the air, water, food and energy that organisms need to survive. It is also considered to be one of the 15 terrestrial biomes of the earth. Like any other ecosystem it is a whole working unit that includes living and nonliving components linked by nutrient and energy cycles. The plant habitats and communities along the bank are considered riparian vegetation and are characterized by their ability and desire to live in wet areas (hydrophilic plants).

Introduction:

Let students know that they are going to learn about riparian zones and the relationship between streams and forests. Remind them of activities they have already done to learn about stream and/or forest ecosystems and foodwebs.

Procedure:

1. Watch the 7 minute Stream Food Web clip from the River Web Educators Video.
2. Ask some guiding questions from the River Web curriculum:
 - What is a riparian zone? (A specific ecosystem that is the interface between land and a river, or stream)

- What is the common life cycle of aquatic insects? (*Eggs hatch in water, larvae grow on the bottoms of streams (or lakes/ponds), larvae (or sometimes pupae) emerge from water and transform into adults, adults mate, females deposit eggs back in water*)
- What are some aquatic insects that emerge from streams? (*Dragonflies, mosquitos, damselflies, mayflies, caddisflies, stoneflies, crane flies, and midges*)
- How do forests feed stream food webs? (*Forests shed leaves and other plant material which feed aquatic organisms, especially invertebrates (shredders and collectors); forest insects fall into streams and are eaten by aquatic organisms, especially fish*)
- How do streams feed forest food webs? (*Stream insects emerge and are eaten by spiders, birds, bats, lizards and other predators (e.g., frogs, snakes); Stream fish are eaten by birds (herons, mergansers, kingfishers, ospreys, eagles), bears, snakes, and other predators*)
- What makes the riparian area so important to the animals who live there? (It provides their necessary food, water, cover, shelter, and space to live and reproduce)

3. Discuss the various functions of a riparian zone with students:

- Forms a bridge between the river and upland habitats
 - Trees and other riparian zone vegetation provide an input of energy & nutrients to the river, and in turn the river provides an input of water, energy, & nutrients to the riparian zone trees and vegetation
- Increases water quality (shade, flow, plants, trees, and soil provide filtration and slow down erosion, etc.)
- Provides lots of water, high moisture levels, rich, deep, and complex soils
- Provides microhabitats (warmer in winter, cooler in summer)
- Provides a variety of plants and trees: often deciduous and shrubs such as alder, willow, cottonwood, elderberry, and salmonberry that provide fruits, nuts & vegetation for herbivores, which in turn, provides food for prey species too
- Provides more layers and covers-niches for wildlife such as newts, frogs, salamanders, and birds
- Safer nesting areas & more insects than conifer forests so lots of invertebrates for birds to feed on, especially good during nesting time
- Safe traveling corridors for bird migration

6. Inform students that they will begin to build a riparian zone and add to it after each activity.

7. Brainstorm with students:

- What sort of things might they want to put into their model riparian zone?
- What materials can they bring from home to help build their models? (nature pictures, toilet paper rolls, rocks, twigs, containers from the recycling, etc.).

8. Show students examples from the following sites that demonstrate how to build models:

<http://www.TeachEngineering.org> or <http://www.wikihow.com/Make-a-Diorama>

9. Have students create a sketch of a model riparian ecosystem that they will use as a guide in the next lesson.

Resources:

Freshwaters Illustrated, (2011) Riverwebs, A true story about life, death, science, and streams.