Lesson Plan:
Biotope Match Up

Big Idea: Living things within an ecosystem depend upon each other in many surprising ways. When the ecosystem is healthy and the populations of its plants and animals are in balance, the living and nonliving resources the ecosystem contains are sufficient to meet the needs of its residents.

Learning Goals:

- Children will be able to define "biotope."
- Children will be able to describe the ways in which a healthy biotope provides sufficient resources to meet the needs of its animal and plant residents.
- Children will investigate different biotopes and the plants and animals that reside in them.

Related Cyberchase Episode: "The Cyberchase Movie, Part 1" (Ep. 904) and "The Cyberchase Movie, Part 2" (Ep. 905)

Grades: 3rd - 5th grade

Definitions:

- *Ecosystem*: Refers to both a physical space and the community of living and non-living things that share it. Ecosystems may be large or small, but they usually extend over many square miles and contain many types of living organisms in complex relationships.
- *Habitat*: The physical space that a specific living organism lives in. It contains the resources such as food, water, and shelter that a particular species needs to survive.
- *Biotope*: A particular compact region of an ecosystem or shared habitat. For example, a tide pool shared by dozens of sea creatures is a biotope that is found within a shoreline ecosystem.

Materials:

- 3 biotope posters (included)
- Biotope trading cards (included)
- Computers with Internet access, one available for whole-class viewing

Prep:

- Print the biotope posters and trading cards listed above.
- Cut out the trading cards.
- Cue up the provided video clip from "The Cyberchase Movie."

Before Watching the Video Clip:

- Review the definitions of habitat, ecosystem, and biotope with your class.

Watch the Video Clip:

Ecotopia is a thriving nature preserve in Cyberspace, under the guardianship of Ranger Abby and her son Ollie. He's a Junior Ranger now, but dreams of being a "real" Ranger. Abby helps Ollie learn about the biotopes in the preserve (forest, mangrove, and lake), the animals that live there, and why each biotope is the perfect home for its residents.

After Watching the Video Clip:

Activity 1:

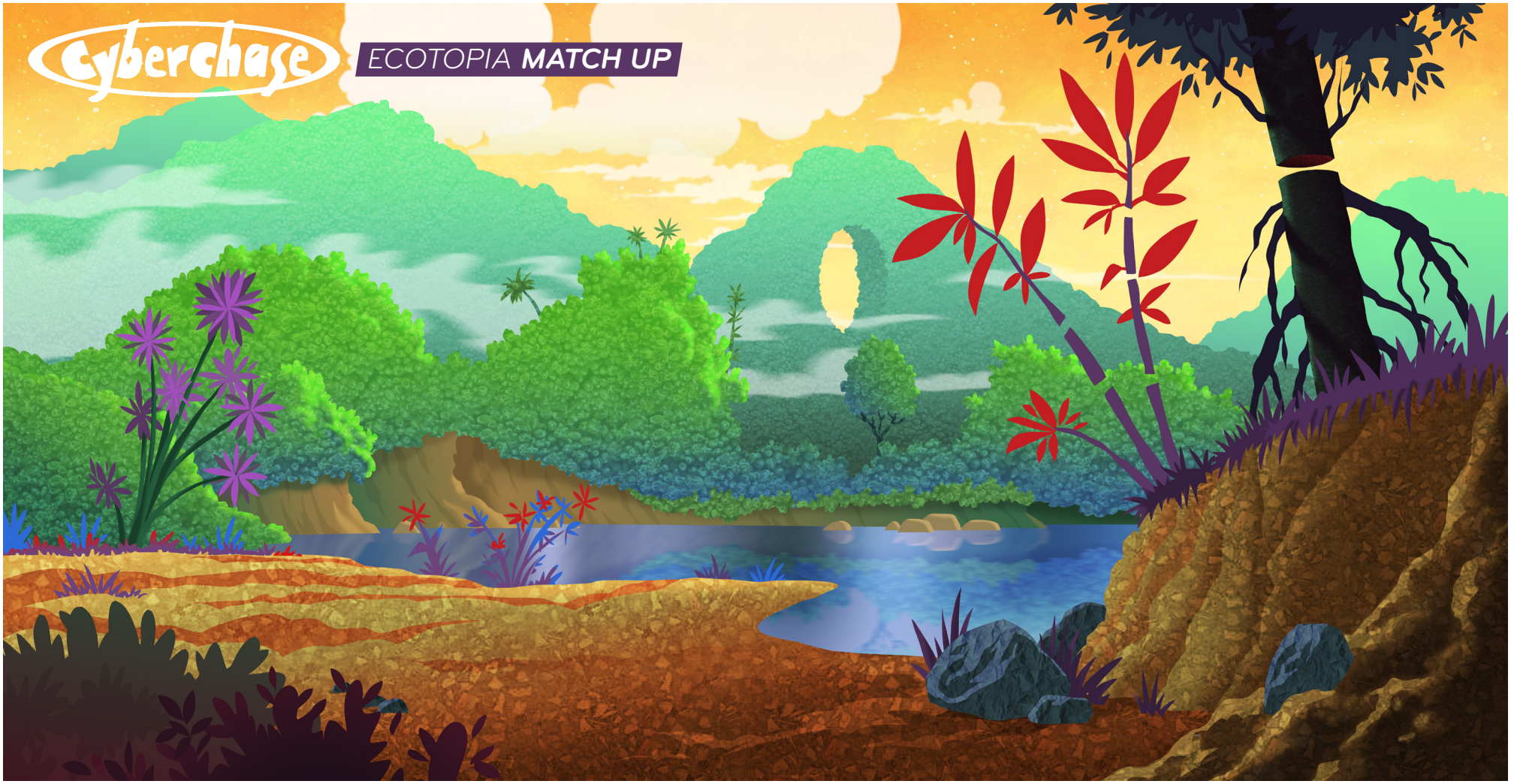
- Tell students that, although Ecotopia contains biotopes different from those in the real world, the plants and animals are connected to each other and their environment in ways similar to ours. For example, some fish need to live in saltwater. Some plant species need insects and animals to spread their pollen. In this activity, the students' mission is to match the animals and plants of Ecotopia to the biotopes where they'll survive and thrive.
- Display the biotope posters in 3 corners of the room.
- Hand out trading cards, one per student.
- Quickly review vocabulary that might be unfamiliar to students: lowland, tide, salt-tolerant, freshwater, swampy, damp, pollen and pollination.
- Announce that you have 3 biotopes available, each in fabulous "move-in" condition – a place for each plant or animal on the cards the students are holding. Review the characteristics of each biotope with your students.
- Have the students review the characteristics of the plant or animal on their cards and ponder the best biotope for it. *Tip: Divide students into groups and have them discuss together.*
- On your signal, have students move to the biotope most suitable for their plants or animals.
- Ask students in each biotope to explain why it's a suitable place for their plant or animal to live, providing evidence from the characteristics listed on their cards.

Activity 2:

- Go to the "About Tidepools" lesson on PBS LearningMedia (link below), and launch the "About Tidepools" slideshow. Watch with your students. Discuss the conditions present in a tidepool and the characteristics plants and animals might need to survive there. Answers might include: ability to live in saltwater and "hold on" in crashing waves, ability to find something to eat, or ability to protect oneself from predators.
- Assign each group one of the following tide pool plants or animals to research: algae, barnacles, chiton, limpet, snail, starfish (sea star), urchin, sea anemone, crab. (All are featured in at least 2 of the 3 websites listed below.)
- Have each group of students create a biotope card for its plant or animal. Bulleted items should answer:
    - What does it eat? (if it's an animal)
    - How does it move? (if it does)
    - What protection does it have from predators or living conditions in a tide pool?
- Have groups share information with the class as time permits. Discuss interdependencies and any characteristics the animals have in common.

Additonal Resources:

- "About Tidepools" from PBS LearningMedia
  http://www.pbslearningmedia.org/resource/lsps07.sci.life.oate.tidepools/exploring-tidepools/
- Tide pool organisms – click on the pictures on the bottom to learn more about each
  http://www.calstatela.edu/faculty/eviau/edit557/oceans/norma/otdpls.htm
- Tide pool organisms – pdf
  http://www.crystalcovebeachcottages.com/resources/TidepoolOrganisms.pdf



Lake biotope

A natural body of freshwater

Provides a home to fish, reptiles, birds and other animals

Shoreline provides a nesting place for birds and a place for reptiles to lay eggs

Deep water provides a safe place for fish and small reptiles to hide

Mangrove biotope

Swampy, salt-tolerant forest located near saltwater shoreline

Floods and drains each day as the tide comes in and goes out

Mangrove trees have roots that rise above the ground and anchor the trees to the wet, muddy soil

Trees have many leaves for animals to feed on

Forest biotope

Contains a tall level of rainforest trees called a canopy

Ground is shady and covered with fallen leaves, twigs and plants

Provides an excellent home for tree-dwelling animals

Contains trees with strong-smelling fruit eaten by monkeys, apes, elephants and rhinos

Cyberchase

Durian Tree

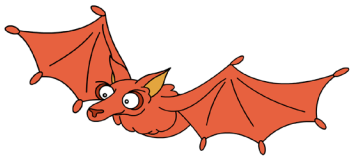
- Grows in lowland rainforests
- Produces a strong-smelling fruit some people describe as "stinky"
- Relies on Dawn Bat for pollination

Cyberchase

Orangutan

- Eats Durian Fruit
- Travels through forest from branch to branch
- Makes leafy nests in tree branches

Cyberchase



Dawn Bat

- Lives in caves and hollow tree cavities in lowland forests
- Active at night
- Feeds on pollen and nectar of Indian Trumpet Flower, fig and Durian Fruit

Cyberchase

Proboscis Monkey

- Often found in swampy forests that are flooded by tides
- Diet consists mostly of tree leaves with some fruit and nuts
- Sleeps in trees and travels from tree to tree

Cyberchase

Giant Mudskipper

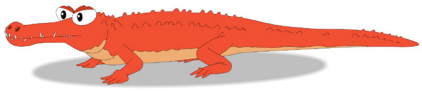
- Fish that uses its fins to walk on land
- Lives in burrows in the mud and appears on land during low tides
- Feeds on insects, sandworms, and small crustaceans

Cyberchase

Goanna Lizard

- Lives near damp forests and coastal rivers
- Feeds on insects, crabs, and the eggs of reptiles, birds and other animals
- Can live in salty water by excreting salt through its nose (salty snot!)

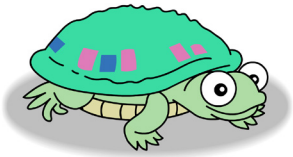
Cyberchase



Crocodile

- Large, carnivorous reptile
- Good swimmer that can move fast on land as well
- Lives in freshwater lakes and rivers

Cyberchase



Turtle

- Lives in freshwater, like lakes, ponds or slow-moving streams
- Feeds on worms, snails and shrimp
- Lays its eggs in a nest near the water's edge

Cyberchase

Stork

- Wading bird that feeds in shallow water
- Found in freshwater habitats
- Feeds on fish