

Lunch Buddies

Objectives

Students will: 1) will understand interdependence in ecological systems; 2) will describe examples of symbiotic relationships between plants and animals.

Method

Students research native plants and animals associated with those plants and play a card game to explore the interdependence between them.

Materials

Index cards (4 per group); copies of master cards (one per small group); field guides and other reference materials.

Background

Virginia is home to thousands of species of plants and wildlife. Many of them depend upon each other. Consider the zebra swallowtail butterfly whose exclusive larval food is the paw paw tree.

Our native wildlife species evolved over time to feed on native plants.

Leaves, shoots, berries, nuts or nectar are available at crucial times during migration or when young are born. Some of the relationships are so specific; scientists consider the relationship to be interdependent. Although non-native plants may also provide food and shelter they may not be best suited for Virginia soils and climate or provide the nutrition or other specific requirement needed by some species.

The activity below matches wildlife to one of the plants they depend upon. The plants and species in this activity is only a sample of the variety found in Virginia. Most can be found in each region of the state. Some are suited for schoolyard gardens and habitats; others are best avoided although they are great for wildlife are not suitable for schoolyards. Teachers and students are encouraged to add to this list by conducting their own research in the library or on-line.

Procedure

- As a class; research a list of native plants in the area using field guides and the internet- creating a master list of plants.
<http://www.wildflower.org/explore>
http://www.dcr.virginia.gov/natural_heritage/index.shtml
[http://www.nativeplantcenter.net/Digital Atlas of the Virginia Flora](http://www.nativeplantcenter.net/DigitalAtlasoftheVirginiaFlora)
- Divide students into pairs or groups of 3.
- Each group chooses one plant from the master list. The team then researches a wildlife species dependent upon the plant.
- For a list of Virginia wildlife species visit
<http://www.dgif.virginia.gov/wildlife/>
Your class can research individual birds at
www.allaboutbirds.org
- Some plants are eaten by several species and the classroom will need to discuss and decide which species to highlight for each plant. Once completed the class should have 12-15 pairs of plants and animals.
- Provide each team with four 4x6 index cards. Instruct the team to cut the cards in half creating a card that is 3"x 4" ; information about the plant is written on one half of the index card and information about the animal on the other half. They should duplicate the information forming 4 identical sets of cards. These will be used in creating 4 full decks of Lunch Buddy cards for the class to complete the activity.

Grade Level: 4- 7

Subject Areas: Science and Language Arts

Standards of Learning:

- Science: 4.5, LS.6
- Language Arts: 4.9, 5.9, 6.9, 7.9 (only if the research section is done)

Group Size: small groups of 4 or 5

Duration:

Key Terms: native plants, species, interdependence , ecosystem

- Collect all the cards from each team and divide into decks. Hint: if you provide each team with 4 different color cards you can easily create the 4 separate decks of Lunch Buddy cards.
- Add one card to each deck with the words "Lunch Buddy" this card will not have a match.

Activity

1. Divide students again into groups of 4-5. Separate the members of the first research groups so you have experts on the different pairs in each new group.
2. Game is played similar to Old Maid.
 - The Lunch Buddy Deck is dealt out completely to the group of students. Since there will be an odd number of cards at least one player will receive an extra card.
 - Players remove all matches from their hand. They may discuss matches at this time, each person having the opportunity to share what plants the animals depend upon.
 - The remaining cards should be held in the player's hands so other players can not see the information.
 - The player who is wearing the most green (or other color) goes first. Teachers may choose the starting player if desired.
 - The first player picks a card from the player to his/her right, checks for a match and then completes his/her play. Next player picks from the person on their right and so on until one player is left holding the "Lunch Buddy" card and all matches have been made.
3. The player with the most matches wins unless they end up with the Lunch Buddy card in which case the next highest number of matches wins.

Alternative activity

If you do not have time for the students to conduct their own research and create the decks of cards you can use the table below to create a deck of cards.

Copy the Lunch Buddies cards and paste onto index cards or card stock, make one set of cards for every 4 – 5 students. Teachers may also want to provide each player with a master list of all the matches and review the table below before playing the game.

Play the game as described above.

Evaluation

Students define interdependence using specific examples.

Students discuss the following:

- How might non-native or invasive species 'shrink" habitat?
- How might non-native plants (and animals) affect an ecosystem?
- How might the class improve the surrounding habitat?

Cards

Lunch Buddy	Lunch Buddy
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(make one Lunch Buddy card per deck)	(make one Lunch Buddy card per deck)
Mockernut Hickory <i>Carya alba</i> Provides shelter and nuts for a wide variety of species. The smooth nut is inside a thick walled outer husk. The tree can reach over 100 feet in height. Squirrels will bury the nuts to feed on throughout the winter months.	Gray Squirrel <i>Sciurus carolinensis</i> Feeds on nuts from hickories along with berries, mushrooms, acorns and some insects. Under the tree you can find the hickory shells with the chewing marks made by the squirrel's sharp teeth.
Field Thistle <i>Cirsium discolor</i> Provides seeds for a variety of species including the Goldfinch. The soft lining of the goldfinch's nest is made of thistle down. This plant belongs to the Aster family and is not a thistle at all.	Goldfinch <i>Spinus tristis</i> This bright yellow bird feeds on a variety of seeds and uses field thistle down to line its nest. Often seen at winter feeders in their greenish yellow plumage.
American Holly <i>Ilex opaca</i> The berries on this tree last all winter providing a source of food for a variety of birds and small mammals. Male and female flowers are on separate trees and only female trees have berries. Holly trees are green year round and will have berries late into the winter months.	Deer mouse <i>Peromyscus maniculatus</i> Deer mice and other small mammals depend upon the seeds of holly and many other plants to make it through the winter. The thick foliage helps protect the mouse from overhead predators.
Devil's Walking Stick <i>Aralia spinosa</i> Do NOT grab this small tree or you will end up with a handful of thorns. The large leaves grow in a crown at the very top of the thin trunk covered with thorns. In the fall hot pink stems support clusters of black berries that are eagerly eaten by birds including catbirds, robins, chickadees, cardinals and many others.	Gray Catbird <i>Dumetella carolinensis</i> When available the catbird will feed on berries from the Devil's Walking Stick but also feeds on a variety of other berries and insects. The catbird makes a mewing sound like a cat but can mimic other sounds it hears.
Witch Hazel <i>Hamamelis virginiana</i> A small tree that goes in moist areas in the forest. The witch hazel blooms in the fall and will sometimes be in bloom after leaves have fallen.	Beavers <i>Castor canadensis</i> eat the inner bark or cambium layer of a variety of tree species. Witch hazel which grows on moist sites is one of many tree species that make up part of the beaver's lunch.
Swamp Milkweed <i>Asclepias incarnata</i> Grows in moist soils and produces clusters of pink flowers that provide nectar for a variety of insects including Monarch Butterflies. The flowers produce a seed capsule containing hundreds of seeds, each with a silken parachute to float away on. The milkweed is the host plant for the monarch caterpillar.	Monarch Butterfly <i>Danus plexippus</i> Caterpillars can be found on milkweed plants eating leaves for about 10 days to 2 weeks before turning into a chrysalis and then emerging as a bright orange butterfly. Monarchs migrate to Mexico where the adults spend the winter before heading north to begin the cycle again.
Flowering Dogwood <i>Asclepias incarnata</i> Virginia's state tree and flower is a small tree with white flowers that fill the forests each spring. In the fall there is a cluster of red berries where each flower had bloomed. The red berries are consumed by a variety of small mammals and birds including our state bird the Cardinal.	Cardinals <i>Cardinalis cardinalis</i> represent Virginia as our state bird. The brilliant red feathers make this species easy to see as they make their home in our yards. Cardinals will sing to defend their territory often nesting in a shrub in yards. They eat a variety of fruits including those of our state tree the flowering dogwood.
Trumpet Vine <i>Campsis radicans</i> This showy vine is a favorite of Hummingbirds throughout its range. The vine produces bright orange trumpet like flowers that are available all summer.	Ruby Throated Hummingbird <i>Archilochus colubris</i> Hummingbirds are attracted to bright red and orange flowers such as those of the trumpet vine. Their long beak and tongue allows them to feed upon the nectar of these long blooms.
White Oak <i>Quercus alba</i> this tall majestic tree is long lived and provides food and shelter for a wide	Black Bear <i>Ursus americanus</i> depend on the acorns of the white oak and other species of oak to fatten

variety of wildlife. Acorns make up to 50% of the fall diet of bears, turkey, deer, squirrels and others. Acorns are rich in calories from fats and proteins.	up each fall before hibernating. Bears may eat over 10,000 calories each day from sources such as acorns, berries and insects.
Cucumber Tree <i>Magnolia acuminata</i> Is a member of the magnolia family growing over 60 feet tall. The greenish flowers produces a reddish cucumber like fruit that will fall to the ground becoming food for small mammals and ground feeding birds.	Eastern Towhee <i>Pipilo erythrophthalmus</i> is a small dark bird with orange sides and a white belly. They feed on the ground scratching for seeds and berries that fall from the trees overhead.
Green Brier <i>Smilax rotundifolia</i> It is easy to figure out how this green vine with briars or thorns got its name. Found in fields and along the edges of the wooded areas, greenbrier provides berries for birds during the winter and vegetation for rabbits and deer year round.	Rabbit <i>Sylvilagus floridanus</i> A clean cut at a 45 degree angle is an indicator that a cottontail rabbit has been eating your greenbrier. Not only does the plant provide nutrition for the rabbit but a dense tangle of greenbrier provide protection from the rabbits many predators.
Loblolly pine <i>Pinus taeda</i> can be found throughout the eastern half of Virginia. This species can reach over 100 feet in height and has a long straight trunk. It is often the species chosen to be planted after a forest has been cut. Many species feed on the seeds and cones of the loblolly pine including several species of birds and fox squirrels.	Delmarva Peninsula Fox Squirrel <i>Sciurus niger cinereus</i> along with the Southeastern Fox Squirrel <i>Sciurus niger niger</i> prefer mature pine forests that are nearby hardwood stands. The Delmarva fox squirrel is considered endangered and the southeastern squirrel is rare. Both species feed on a variety of plants including the cones of Loblolly Pine. Both species are much larger than the grey squirrel common throughout Virginia.
Paw Paw <i>Asimina triloba</i> This small woodland tree like moist soils and has a small deep purple flower in the spring. The flowers developed into a sweet banana type fruit that is eagerly eaten by opossums, raccoons and deer. The leaves are eaten by the caterpillar of the Zebra Swallowtail butterfly.	Opossums <i>Didelphis virginiana</i> are omnivores and eat a wide variety of foods including fruits of the Paw Paw tree, insects and even carrion. They are Virginia's only marsupial and can carry a dozen baby opossums in their pouch. Opossums have a prehensile tail but do NOT sleep by hanging upside down by their tail.
Wax Myrtle <i>Morella cerifera</i> The blue gray berries of the wax myrtle are rich in fiber and fat. Colonists would melt the berries and use the fat to create bayberry candles. Several species of birds will feed on the berries including turkeys, quail and the yellow rump warbler. The plant is the host species for the caterpillar of the red banded hairstreak butterfly.	Yellow Rump Warbler <i>Dendroica coronata</i> once called the myrtle warbler, is the only warbler that can digest the waxy coat of the wax myrtle berries. Insects make up the majority of its diet. This species will winter in Virginia and breeds much further north in Canada.
Virginia Creeper <i>Parthenocissus quinquefolia</i> Around Virginia's State Seal you will see the fall colors of the Virginia creeper with its deep blue berries. This vine can be found in most of the state and can be easily identified by the 5 leaflets. The berries are a favorite of many species of birds including thrushes.	Brown Thrasher <i>Toxostoma rufum</i> a large rusty brown bird that tends to be shy, staying out of sight of people. It has a full rich song and is more often heard than seen. Thrashers are omnivores eating a wide variety of berries, insects, other invertebrates and small reptiles. It likes to forage in thickets at the forests edge such as those created by Virginia creeper vines.
Eastern Red Cedar <i>Juniperus virginiana</i> is also seen along rural roads where the seeds have been planted	Cedar Waxwing <i>Bombycilla cedrorum</i> In late winter, Cedar Waxwings will feed on the remaining

<p>by a variety of songbirds sitting on the power lines. The grayish blue berries are an important food source for many species including cedar waxwings. The dense winter foliage provides shelter during winter snow storms.</p>	<p>berries of cedars on their migration route back to their nesting grounds.</p>
<p>Eastern Redbud <i>Cercis canadensis</i> is one of the first trees to bloom in the spring. The reddish purple flowers stand out in an otherwise gray forest. The blooms produce nectar for native bees and other insects. The 2 inch bean like seed pods develop quickly providing food for many species. The pods as well as the tips of the branches are often eaten by deer.</p>	<p>White-tail Deer <i>Odocoileus virginianus</i> Deer are browsers; eating the woody tips of redbud, oak, hickory and many other woody plants. They will also eat on acorns, grasses and ornamental plants. Deer are one of Virginia's largest and most familiar land mammals. They are found statewide with the most dense populations in northern Virginia.</p>