This Old Habitat Activities

Part IV – Interdependence Shuffle

There are two versions of this game, the computer version and the classroom version. To play the computer version go to http://www.fieldmuseum.org/thisoldhabitat/interactive.html and follow the instructions. For the classroom version, you will need to make copies of the organism cards on *Activity Page #4B*, and a 5 foot piece of string for each student. There are a total of 30 cards. The last 8 cards have a #2 on the bottom which indicates they are duplicates. Make sure to pass out the first set of 22 cards before using the duplicate cards; these are used for a group of more than 22 students.

On *Activity Page #4* there is a list of all of the information that is on the organism cards and four situations. Each situation will be read aloud to the class and students will be directed to organize themselves into groups of organisms or match up with one or more other organisms. After a situation is called out, and the students have organized themselves, have each organism or pair or group of organisms explain why they are in the chosen location or group.

For example:
The educator will ask all students to organize into pairs of predator/prey or producer/consumer organisms. After they have sorted themselves out, have each pair say what organism they are and describe the interaction. Continuing with the predator prey example, a student pair would say “I am a mouse” and “I am an owl.” “Owls eat mice which is a predator/prey relationship.” The situations get increasingly more difficult!

Activity Page #4

List of organisms and situations and answers (organism cards are on Activity Page #4B)

1. Goldfinch (a bird that eats seeds, nests in trees)
2. Garter snake (a reptile that eats small mammals, fish, lizards, frogs, slugs, earthworms, leeches and salamanders)
3. Grasshopper (an insect that eats grassland plants like bluestem and coneflower)
4. Mouse (a mammal that eats seeds and fruit, insects, and fungi, is eaten by hawks, owls)
5. Oak tree (produces leaves and acorns and provides shelter, drops its leaves in the fall)
6. Big bluestem grass (provides food [seeds] to birds and small mammals)
7. Squirrel (a mammal that eats seeds, fruit, and fungi, nests in trees)
8. Milkweed plant (only food for monarch caterpillars and monarch butterflies)
9. Monarch butterfly and larvae (butterfly pollinates the milkweed plant, larvae eat the leaves)
10. Hawk (a bird that eats small mammals, small birds and snakes, and nests in trees)
11. Aphids (a small insect that sucks liquids from plant stems, and leave behind a sticky "honeydew")
12. Ants (a small insect that eats honeydew made by aphids, other small insects and invertebrates, they protect aphids from predators)
13. Purple coneflower (produces seeds that birds and mice eat)
14. Mole (a mammal that eats worms, millipedes, and other soil creatures)
15. Owl (a bird that eats small mammals, and nests in trees)
16. Fox (a mammal that eats small mammals, grasshoppers, earthworms, amphibians)
17. Salamander (an amphibian that eats worms and insects, lives underneath fallen tree branches and logs; eaten by snake and fox)
18. Earthworm (a decomposer, that eats dead leaves and aerates and enriches the soil with nutrients, thereby helping plants)
19. Lady bug (an insect that eats aphids)
20. Bluebird (a bird that eats insects and invertebrates)
21. Millipede (an invertebrate that is a decomposer, that eats dead plant material and releases nutrients, thereby helping plants)
22. Leopard frog (an amphibian that eats insects and invertebrates)

Situations

Remember to check for correct organization and/or pairing after each situation. If students have made mistakes, discuss where that organism should be and why.

1. Identify three areas of the classroom, and give each one of the following names, producer, consumer, and decomposer. Have each student go to the correct area of the room for their organism. This is how the organisms should be grouped:

   Producer: purple coneflower, oak tree, milkweed plant, big bluestem
   Decomposer: earthworms and millipedes
   The rest are **consumers**

Activity Page #4 (continued)

2. Have all of the organisms form pairs as either predator/prey or producer/consumer. There are many combinations, here are some:

Predator/prey	**Producer/Consumer**
Salamander or mole/earthworm, millipede	Monarch butterfly and larvae/milkweed
Hawk/garter snake or mole or mouse	Squirrel/oak tree acorn
Owl/mouse or mole	Grasshopper/big bluestem
Fox/mole or mouse	Goldfinch/purple coneflower seeds
Leopard frog/millipede or earthworm	
Ladybug/aphid	
Bluebird/Ant or millipede or ladybug	
Garter snake/ant or earthworm or grasshopper	

3. Have students get into groups of 2 or 3 students that demonstrate mutualism or commensalism. More than one type of relationship can be demonstrated in a group of three. Some examples are below. Explain that everyone may not be able to be a part of one of these groups. All of those that are not in a mutualism or commensalism group should form their own group and identify what they all have in common. (They are predators)

   a) Oak tree/squirrel (mutualism - squirrels gain nutrients from acorns when they eat them. Squirrels also hide and forget about some of them, which then grow into new oak trees)
   b) Oak tree/ hawks, owls, goldfinch, and bluebirds (commensalism - all these birds nest in trees)
   c) Goldfinch/purple coneflower (mutualism - birds eat seeds and then spread seeds)
   d) Ants/aphids (mutualism - ants protect aphids, aphids provide food for ants)
   e) Earthworms or millipedes and any plant (mutualism - when the plant dies it provides food, and the earthworm aerates the soil which helps plants)
   f) Monarch/milkweed (mutualism)
   g) Ladybug and plants (commensalism – lady bugs eat aphids which can damage plants)

4. Give each student a 5 foot piece of string. Have students form a single web of interdependence, by handing one end of their string to an organism with which they have an interdependent relationship. The organisms can be linked in any way. After everyone is connected, find out which organisms are holding the most strings, and which are holding the least. (The producers and decomposers will have the most strings and the predators will have the least.)
   - *Purple coneflower* (makes seeds that are eaten by *goldfinch* and *mice* and is helped by *Earthworms* that aerate the soil)
   - *Mouse* (eats *purple coneflower seeds*, and is eaten by *hawks*, *owls*, and *fox*)
   - *Earthworm* (eaten by *garter snakes, frogs, moles* and *salamanders*, helps *oak tree, milkweed*, *purple coneflower* and *big bluestem)*
   - *Mole (*eats *millipedes, grasshoppers, worms;* eaten by *fox, hawks* and *owls)*
   - *Frog* (eats *millipedes, grasshoppers, worms*)
   - *Millipede (*helps *oak tree, milkweed*, *purple coneflower* and *big bluestem*
   - *Big Bluestem* (eaten by *grasshoppers*)

- *Oak tree* (*squirrels* eat and spread acorns; provides nest sites for squirrels, birds)
- *Milkweed* (*aphids* -suck juices, *monarch* adult feeds on nectar and pollinates it, and larvae eat its leaves)
- *Aphids (*have a mutualistic relationship with *ants* and are eaten by *ladybugs*)
- *Bluebird* (eats *ants, ladybugs,* and *grasshoppers*)

5. Review with students the concept of interdependence, but not just between individual organisms, but also by whole communities of producers, consumers and decomposers. They all depend on one another for survival.

Activity Page #4B

Goldfinch **a bird that eats seeds, nests in trees**	**Garter snake** **a reptile that eats small mammals, fish, lizards, frogs, slugs, earthworms, leeches and salamanders**
Grasshopper **an insect that eats grassland plants like bluestem and coneflower**	**Mouse** **a mammal that eats seeds and fruit, insects, and fungi, is eaten by hawks, owls**
Oak tree **produces leaves and acorns and provides shelter, drops its leaves in the fall**	**Big bluestem grass** **provides food [seeds] to birds and small mammals**
Squirrel **a mammal that eats seeds, fruit, and fungi, nests in trees**	**Milkweed plant** **only food for monarch caterpillars and monarch butterflies**
Monarch butterfly and larvae butterfly **pollinates the milkweed plant, larvae eat the leaves**	**Hawk** **a bird that eats small mammals, small birds and snakes, and nests in trees**

Activity Page #4B (continued)

Aphid a small insect that sucks liquids from plant stems, and leave behind a sticky "honeydew"	**Ant** a small insect that eats honeydew made by aphids, and other small insects, they protect aphids from predators
Purple coneflower produces seeds that birds and mice eat	**Mole** a mammal that eats worms, millipedes, and other soil creatures
Owl a bird that eats small mammals, and nests in trees	**Fox** a mammal that eats small mammals, grasshoppers, earthworms, amphibians
Salamander an amphibian that eats worms and insects, lives underneath fallen tree branches and logs; eaten by snake and fox	**Earthworm** a decomposer, that eats dead leaves and aerates and enriches the soil with nutrients, thereby helping plants
Lady bug an insect that eats aphids	**Bluebird** a bird that eats insects and invertebrates

Activity Page #4B (continued)

Millipede **an invertebrate that is a decomposer, that eats dead plant material and releases nutrients, thereby helping plants**	**Leopard frog** **an amphibian that eats insects and invertebrates**
Oak tree **produces leaves and acorns and provides shelter, drops its leaves in the fall** **#2**	**Big bluestem grass** **provides food [seeds] to birds and small mammals** **#2**
Purple coneflower **produces seeds that birds and mice eat** **#2**	**Mole** **a mammal that eats worms, millipedes, and other soil creatures** **#2**
Millipede **an invertebrate that is a decomposer, that eats dead plant material and releases nutrients, thereby helping plants** **#2**	**Grasshopper** **an insect that eats grassland plants like bluestem and coneflower** **#2**
Goldfinch **a bird that eats seeds, nests in trees** **#2**	**Earthworm** **a decomposer, that eats dead leaves and aerates and enriches the soil with nutrients, thereby helping plants** **#2**

Activity Page #3
Homework

Interdependence Challenge
Instructions
On a separate piece of paper give three examples of how organisms are interdependent. List one example each of consumer/producer, predator/prey, and commensalism. You get the most points for giving examples of real organisms (examples that are in the video do not count). For each example, name the organisms and why the relationship is an example of consumer/producer, predator/prey, and

commensalism. For each example you list, describe how each organism (and the population of that organism) would be affected if one of the organisms were removed.

Grading System

Student accurately describes:

- a consumer/producer relationship between two organisms. *10 points*
- why the relationship is an example of consumer/producer *10 points*
- how each organism (and the population of that organism) would be affected if one of the organisms were removed *10 points*

Student accurately describes

- a predator/prey relationship between two organisms. *10 points*
- why the relationship is an example of predator/prey *10 points*
- how each organism (and the population of that organism) would be affected if one of the organisms were removed *10 points*

Student accurately describes

- a relationship of commensalism between two organisms . *10 points*
- why the relationship is an example of commensalism *10 points*
- how each organism (and the population of that organism) would be affected if one of the organisms were removed *10 points*

Optional: 10 points for giving an example of mutualism, parasitism, or a decomposer.