Creating Food Chains & Webs

Summary
Students are introduced to wetlands by organizing living things that are found in wetlands into food webs and food chains; classifying them according to their role within the chain and web.

Materials
- Print and cut out cards (recommend laminating for reuse)
- Print or project image of wetland animal & plant scene
- Print activity sheet for students (one page per student OR one per pair, copy double-sided, one side with activity sheet, the other side showing the wetland scene with reference numbers)
- Chalk, White or Smart board
- Writing utensils

Procedure

Warm Up
Begin by asking students to brainstorm what the word ‘food chain’ means when used in the context of nature and living things. Then ask students what they think ‘food web’ means in the same context.

Explain that a food chain is... (see note below). Show accompanying example of a food chain (which showcases living things found within a wetland setting). Have a brief discussion of what is shown in the example, and accompanying definition. Then ask students if only a muskrat could eat a cattail, or if a coyote only eats muskrats. Living things within a community have far more complex relationships then just one animal eating only one producer, etc.

A food chain is a means to show how energy is transferred from one living thing to the next. Food chains always begin with a producer, which will always be some form of plant. Plants convert the sun’s energy into consumable energy. When a plant is consumed, the plant’s energy is given to the animal who ate it, called the primary consumer. The consumer who eats the primary consumer is called the secondary consumer, and the chain continues from there.

A food web is a means to demonstrate the predator-prey and consumer-producer relationships within a habitat, and is made up of a network of food chains. A food web will always include producers (plants who convert the sun’s energy to consumable energy) and consumers (those who eat living things). Food webs are able to show the more complex and interconnected nature of living things within a particular habitat or community.
Show accompanying example of a food web (which showcases living things found within a wetland setting), and have a brief discussion of what is shown in the example, and accompanying definition.

**Activity**

Explain that students will be organizing living things that are found in wetland habitats into food chains and webs, classifying them according to their role within the chain and web. A wetland is... (see note below). Wetlands cover almost half of Manitoba (41%), and are home to many different kinds of plant and animal communities.

Show or project image of the animal and plant wetland scene (first without the reference numbers), asking students if they recognize any animals. Then show or project the image of the wetland scene with the reference numbers, identifying all the living things within the scene.

Hand out the food chain activity sheet and a card to each student. Explain that students will use their cards (that each show one of the living things included in the wetland scene) to create three different food chains. Students are encouraged to reference the cards to help them figure out what eats what in order to help them build food chains. Students will then write in their answers on the activity sheet.

**Wrap Up**

Once students have finished filling in their food chains, explain that the class will create a food web using the food chains they all just created. As students offer their answers, draw the developing food web on a board, asking students how the different food chains connect with one another.

Conclude by explaining that as a class you will be visiting a wetland (like the one shown in the picture) called Oak Hammock Marsh where students will be exposed to the many different living things that are found in a wetland, including some of those used to create the food chains and food webs.

**A wetland is** an area of land that holds shallow water, with a maximum depth of two metres. The water makes the soil very moist, so plants who need moist soils will grow in and around the water; this is why a wetland can not be deeper then two metres, because otherwise these kinds of plants drown and do not receive enough sunlight. The water moves slowly because there are so many plants that slow the water down, absorbing some of the water like a sponge and filtering it as it moves through.

**Naturalist’s Note:**

When organizing animals into food chains and food webs, or when classifying animals as either herbivore, omnivore, or carnivore, it should be noted that these classifications are not as straightforward as ‘this animal only eats this, and this animal only eats that.’ In nature, animals behave in a far more complex manner.

For example, a white-tailed deer is classified as a herbivore (only eating vegetation), but they in fact do eat mice or even baby birds if the opportunity arises, for the nutrients in that food source is far too valuable to pass up. You may ask ‘why are white-tailed deer classified as herbivores then if they also eat meat?’ White-tailed deer are classified as herbivores because they only seek out vegetation, eating meat only if the opportunity presents itself, where as an omnivore seeks out both vegetation and meat. Additionally, herbivores teeth are shaped differently then those of omnivores and carnivores, which them best for eating vegetation.

All animals are opportunistic to some extent, and will usually not pass up valuable nutrients when they are presented with some.
A food chain is a means to show how energy is transferred from one living thing to the next. Food chains always begin with a producer, which will always be some form of plant. Plants convert the Sun’s energy into consumable energy, so when a plant is consumed, the plant’s energy is given to the animal who ate it, and is referred to as the primary consumer. The consumer who eats the primary consumer is called the secondary (second) consumer, and the chain goes on and on from there.
A food web is a means to demonstrate the predator-prey and consumer-producer relationships within a habitat, and is made up of a network of food chains. A food web will always include producers (plants who convert the Sun’s energy to consumable energy) and consumers (those who eat living things). Unlike a food chain, food webs are able to show the more complex and interconnected nature of living things within a particular habitat or community.

Cattails (Producer)

Pond Snail (Prey, Consumer)

Coyote (Predator, Consumer)

Muskrat (Prey, Consumer)

Snowy Owl (Predator, Consumer)

Mallard (Prey, Consumer)

Cottontail (Prey, Consumer)

Canada Goose (Prey, Consumer)

Grass (Producer)
Narrow-leaved Cattail
Eats: Turns sunlight into energy
Eaten By: Muskrat
Humans
Pond Snail
Mallard
Painted Turtle

Coontail
Eats: Turns sunlight into energy
Eaten By: Pond Snail
Mallard
Painted Turtle
Muskrat

Arum-leaved Arrowhead
Eats: Turns sunlight into energy
Eaten By: Pond Snail
Mallard
Painted Turtle
Muskrat
Canada Goose

Bulrush
Eats: Turns sunlight into energy
Eaten By: Pond Snail
Muskrat
Mallard
Painted Turtle
Canada Goose

Grass
Eats: Turns sunlight into energy
Eaten By: Muskrat
Coyote
Canada Goose
Painted Turtle
Red-winged Blackbird
White-tailed Deer

Duckweed
Eats: Turns sunlight into energy
Eaten By: Narrow-leaved Cattail
Coontail
Mallard
Arum-leaved Arrowhead
Bulrush

Pond Snail
Eats: Narrow-leaved Cattail
Coontail
Mallard
Arum-leaved Arrowhead
Bulrush
Eaten By: Muskrat
Painted Turtle
Northern Pyke
Crayfish
Mallard
Canada Goose
Raccoon
Minnow
Yellow Spotted Salamander
Killdeer

Fresh Water Shrimp
Eats: Dead things (they are scavengers so they eat everything that has died in the water)
Eaten By: Mallard
Minnow
Northern Pyke
Northern Leopard Frog
Yellow Spotted Salamander
Painted Turtle
Killdeer
Marsh Wren
Red-winged Blackbird

Clam:
- Eats: Microscopic organisms (Clams are filter feeders, pulling food out of the water)
- Eaten By: Mallard, Canada Goose, Raccoon

Minnow:
- Eats: Fresh Water Shrimp, Pond Snail, Minnow
- Eaten By: Northern Pyke, Raccoon, Great Blue Heron, Muskrat

Crayfish:
- Eats: Minnow, Northern Leopard Frog, Pond Snail
- Eaten By: Raccoon, Painted Turtle, Great Blue Heron, Killdeer

Dragonfly:
- Eats: Midge, Red-winged Blackbird, Kildeer, Northern Leopard Frog
- Eaten By: Marsh Wren, Raccoon, Great Blue Heron, Killdeer

Northern Pyke:
- Eats: Pond Snail, Fresh Water Shrimp, Minnow, Northern Leopard Frog, Mallard ducklings
- Eaten By: Raccoon, Great Blue Heron, Coyote, Human

Northern Leopard Frog:
- Eats: Pond Snail, Crayfish, Fresh Water Shrimp, Minnow, Northern Leopard Frog
- Eaten By: Raccoon, Painted Turtle, Great Blue Heron, Muskrat, Coyote, Humans, Northern Harrier, Northern Leopard Frog, White-tailed Deer

Painted Turtle:
- Eats: Pond Snail, Crayfish, Fresh Water Shrimp
- Eaten By: Raccoon, Great Blue Heron, Muskrat, Coyote

Yellow Spotted Salamander:
- Eats: Minnow, Northern Leopard Frog
- Eaten By: Raccoon, Great Blue Heron, Muskrat, Coyote

Eats:
- Microscopic organisms (Clams are filter feeders, pulling food out of the water)
- Mallard, Canada Goose, Raccoon

Eaten By:
- Northern Pyke, Raccoon, Great Blue Heron, Muskrat, Coyote, Human

Invertebrate:
- Fish
- Amphibian

Reptile

Crayfish image from seafoodsource.co. Minnow image from earthguide.ucsd.edu/fishes. Pyke & Turtle image from Wikimedia Commons. Salamander image from exploringnature.org.
<table>
<thead>
<tr>
<th>Bird</th>
<th>Mammal</th>
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<tbody>
<tr>
<td><strong>Red-winged Blackbird</strong></td>
<td>Eaten By: Northern Harrier, Coyote White-tailed Deer (eggs)</td>
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<td>Eats: Dragonfly, Midge, Fresh Water Shrimp</td>
<td>Eaten By: Coyote</td>
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<tr>
<td><strong>Killdeer</strong></td>
<td>Eaten By: Northern Harrier, Coyote White-tailed Deer (eggs)</td>
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<tr>
<td>Eats: Midge, Pond Snail, Fresh Water Shrimp</td>
<td>Eaten By: Coyote, Human White-tailed Deer (eggs)</td>
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<tr>
<td><strong>Mallard</strong></td>
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<tr>
<td>Eats: Narrow-leaved Cattails, Arum-leaved Arrowhead, Bulrush, Duckweed, Coontail, Pond Snail, Fresh Water Shrimp</td>
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<tr>
<td><strong>Northern Harrier</strong></td>
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<tr>
<td>Eats: Mallard, Killdeer, Marsh Wren, Red-winged Blackbird, Northern Leopard Frog, Muskrat</td>
<td>Eaten By: Coyote, Humans White-tailed Deer (eggs)</td>
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<td><strong>Canada Goose</strong></td>
<td>Eaten By: Coyote Human White-tailed Deer (eggs)</td>
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<td>Eaten By: Coyote, Human White-tailed Deer (eggs)</td>
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<tr>
<td><strong>Great Blue Heron</strong></td>
<td>Eaten By: Coyote White-tailed Deer (eggs)</td>
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<tr>
<td>Eats: Yellow-spotted Salamanders, Minnow, Crayfish, Northern Leopard Frog, Northern Pyke</td>
<td>Eaten By: Coyote, Human White-tailed Deer (eggs)</td>
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<td><strong>Raccoon</strong></td>
<td>Eaten By: Coyote, Humans</td>
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<tr>
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| Midge | Eats: | Larvae are scavengers (eating dead things) but adults eat nothing. |

 images from: 
Energy is passed from the sun to one living thing to another through a food chain, each living thing adding another link to the chain. Create your own three food chains by filling in the spaces provided.
Create a Food Chain

Energy is passed from the sun to one living thing to another through a food chain, each living thing adding another link to the chain. Create your own three food chains by filling in the spaces provided.

Example

Producer
Narrow-leaved Cattail

Primary Consumer
Muskrat

Secondary Consumer
Northern Harrier

Producer
Coontail

Primary Consumer
Fresh Water Shrimp

Secondary Consumer
Northern Leopard Frog

Tertiary Consumer
Raccoon

Producer
Arum-leaved Arrowhead

Primary Consumer
Pond Snail

Secondary Consumer
Crayfish

Tertiary Consumer
Northern Pyke

Quaternary Consumer
Human

Name: ___________________