



Biodiversity Session Outline For the Outdoor Skills Program

- I. Welcome students and ask group what they remember or learned in the last session.
- II. Activity: Web of Life
- III. Discussion: Come up with other examples of food webs that can be found in their neighborhood or community. Have students take notes or do sketches of these food webs in their journals.
- IV. Activity – If two instructors are used, divide the group in ½ and have each group do one, then switch kids.
 - A. Cast Tracks
 - B. Edible Scat.
- V. Wrap up: Ask the students what they enjoyed most about today’s session and what they enjoyed the least. (Another way to ask is “what was your high today, and what was your low? As the weeks progress this can be called “Time for Highs & Lows”.)

The Outdoor Skills program is a partnership with Nebraska Games & Parks and the UNL Extension/4-H Youth Development Program to provide hands-on lessons for youth during their afterschool time and school days off. It provides the opportunity to master skills in the areas of hunting, fishing, and exploring the outdoors. This educational program is part of the 20 year plan to recruit, develop and retain hunters, anglers, and outdoor enthusiasts in Nebraska.

Inventory

Session: Biodiversity

Kit Materials & Equipment

- (18) Web of life activity cards:
mountain lion, turkey vulture,
bullfrog, purplecone flower, white-
tail deer, girl, worm, red fox, bald
eagle, mouse, corn, tiger swallow tail
butterfly, cottontail rabbit, grass,
large mouth bass, fly, mushroom,
acorn
- (1) Skein of yarn
- (15) Track molds: antelope, badger,
bobcat, cottontail rabbit, coyote,
deer, duck, goose, mink, opossum,
raccoon, red fox, river otter, skunk,
woodchuck
- (13) Replica scat: beaver, bobcat,
cottontail rabbit, cougar, coyote, elk,
mule deer, muskrat, raccoon, red fox
(omnivore), red fox (rodent),
squirrel, whitetail deer
- Mammal tracks sheet
- (7) *Animal Tracks of the Great
Plains* books
- Cooking spray
- Plastic baggies
- Plaster of Paris
- Spoon
- Mixing bowl
- Tootsie rolls
- Food coloring
- Corn pops cereal
- Shredded wheat cereal
- Cinnamon
- Craisins or Raisins
- Cocoa pebbles cereal
- Wint-o-green lifesavers
- Sprinkles

Supplies Instructor Provides

- Copies of mammal tracks sheet

Session: Biodiversity

Activity: Web of Life

Objectives: Participants will 1). gain a basic understanding of food chains and food webs, 2). understand the inter-relatedness between animals in a food web and 3). become familiar with several species of Nebraska wildlife.

Method: Participants will become living organisms in a habitat and create a web of life.

Materials in Tub: Animal and plant signs, ball of yarn, food web poster.

Duration: 30 minutes

Group Size: 12-25

Setting: Indoors or Outdoors

Key Terms: Trophic level, herbivore, omnivore, carnivore, producer, primary/secondary/tertiary consumer, decomposer

SET Ability: Categorize/Order/Classify, Collaborate

Background Information:

A **food chain** shows how each living thing gets its food. Some animals eat plants and some animals eat other animals. For example, a simple food chain links the trees & shrubs, the deer (that eat trees & shrubs), and the mountain lions (that eat the deer). Each link in this chain is food for the next link. A food chain always starts with plant life and ends with an animal.

Plants are called **producers** because they are able to use light energy from the Sun to produce food (sugar) from carbon dioxide and water.

Animals cannot make their own food so they must eat plants and/or other animals. They are called **consumers**. There are three groups of consumers.

Animals that eat ONLY PLANTS are called **herbivores** (or primary consumers).

Animals that eat OTHER ANIMALS are called **carnivores**. Carnivores that eat herbivores are called secondary consumers. Carnivores that eat other carnivores are called tertiary consumers.

Animals who eat BOTH animals and plants are called **omnivores**.

Then there are decomposers (bacteria and fungi) which feed on decaying matter. These decomposers speed up the decaying process that releases mineral salts back into the food chain for absorption by plants as nutrients.

Do you know why there are **more herbivores than carnivores**? In a food chain, energy is passed from one link to another. When a herbivore eats, only a fraction of the energy (that it gets from the plant food) becomes new body

mass; the rest of the energy is lost as waste or used up by the herbivore to carry out its life processes (e.g., movement, digestion, reproduction). Therefore, when the herbivore is eaten by a carnivore, it passes only a small amount of total energy (that it has received) to the carnivore.

Of the energy transferred from the herbivore to the carnivore, some energy will be "wasted" or "used up" by the carnivore. The carnivore then has to eat many herbivores to get enough energy to grow. Because of the large amount of energy that is lost at each link, the amount of energy that is transferred gets less and less.

Each level of consumption in a food chain is called a **trophic level**.

The following gives one example of a food chain and the trophic levels represented in it.

Sample food chain:

Grass → grasshopper → toad
snake → hawk → bacteria of decay

Autotrophs plants

(Producers)

- Grass

Herbivores

(primary consumers)

- Grasshoppers

Carnivores

(secondary, tertiary, quaternary, consumers)

- Toad

- Snake

- Hawk

Decomposers

- Bacteria of decay

Activity:

Procedure

1. Have students brainstorm a list of plants and animals that live in Nebraska. (Animals at the zoo don't count!)
2. Discuss different trophic levels: producers, primary, secondary, and tertiary consumers, and

decomposers (refer to background information). Use the food web poster to illustrate discussion.

3. Hand out colored signs and have each student place it around their neck. Make sure there are more producers than primary consumers, more P.C. than secondary consumers, and so on. (Example- for a class of 20 have 6 producers, 5 primary consumers, 4 secondary consumers, 3 tertiary consumers, and 2 decomposers).
4. Tell students that each sign is marked with a plant or animal. If they student doesn't know what he or she is have them raise their hand. Discuss what plant or animal it is and what habitat it might be found in Nebraska, such as prairie, woodlands, river, etc.
5. Ask the students to stand in a circle. Hand the end of the yarn to a Producer. Have that student choose a Primary Consumer (student with a blue sign) and toss them the ball of yarn. Then have the P.C. choose a Secondary Consumer (student with red sign) and toss them the ball of yarn. Then have the S.C. choose a Tertiary Consumer (student with a yellow sign) and toss them the ball of yarn. Lastly, have the T.C. choose a Decomposer (student with a brown sign) and toss them the ball of yarn.
6. Once the ball of yarn gets to the Decomposer, the leader takes the yarn and starts it over with another Producer. That student tosses the yarn to a Primary Consumer and so on. Continue to do this until all students have a hold of the string.
7. After all the students are connected, ask the students

what might happen to break this connection? What if fire or development destroyed the plants?

8. Have all the Producers drop their yarn. What happens to the web? How are the consumers affected?
9. Introduce the word-Biodiversity. Why is it important? What if only one kind of producer was found in a habitat... do all consumers eat the same thing?

Ideas for Signs (25 students):

- a. Producers (green signs)
 - i. Cottonwood Tree
 - ii. Cattail
 - iii. Oak Tree
 - iv. Goldenrod Flower
 - v. Locust Tree
 - vi. Big Bluestem
Grass
 - vii. Sunflower
- b. Primary Consumers (blue signs)
 - i. Whitetail Deer
 - ii. Beaver
 - iii. Mouse
 - iv. Cottontail Rabbit
 - v. Goldfinch
 - vi. Grasshopper
- c. Secondary Consumers (red signs)
 - i. Snake
 - ii. Coyote
 - iii. Meadowlark
 - iv. Red Fox
 - v. Skunk
- d. Tertiary Consumers (yellow signs)
 - i. Hawk
 - ii. Mountain Lion
 - iii. Great Horned Owl
 - iv. Bobcat
- e. Decomposers (brown signs)
 - i. Bacteria
 - ii. Fungus
 - iii. Detrivores (worms, insects, millipedes)

Session: Biodiversity

Activity: Tracks and Edible Scat

Objectives: Participants will
1). learn to identify common animal tracks and 2). discover why scat is an important tool in identifying wildlife.

Method: Students will make an animal track mold and edible animal scat.

Materials Contained in Tub:

For Tracks activity: track replicas, mammal tracks sheet, casting plaster, plastic spoon, container for mixing, petroleum jelly, track molds, Animal Tracks of the Great Plains books (7)

For Edible Scat activity: scat replicas, scat recipes, animal pictures, Scat Rap student sheet, paper plates

Ingredients for scat: tootsie rolls food coloring, shredded wheat, cinnamon, raisins, cocoa pebbles, wint-o-green lifesavers, sprinkles, corn pops (**Please**

Note: there are more ingredients than you need so please only use only what is necessary.)

Duration: 1 hour

Group Size: any

Setting: Indoors or outdoors

Key Terms: scat, tracks, diet, herbivore, carnivore, omnivore

SET Ability: Compare

Background Information:

A useful way to identify wildlife is to investigate the clues and evidence they leave behind in the wild. Clues to look for include fur, bones, tracks, scat (scientific word for animal poop), etc.

Tracks and scat are useful in identifying animals. When looking at tracks, you can not only tell what type of animal it might be but where it lives (what habitat the track was found in), where it was going, and perhaps, what it was doing (example- track by the water, different animal tracks found together, etc.)

Along with identification, scat can also tell you what the animal eats. A lot of stuff cannot be digested and is eliminated in the animal's poop. You can find bones, fur, and seeds which can indicate what kind of diet the animal might have.

Activity

Before the activity

1. Mix the plaster with water in the container and mix it with the spoon. It will be the consistency of pancake batter.

Procedure

1. Ask the students what clues an animal might leave behind. (Examples: fur, feathers, bones, tracks, scat, etc.)
2. Show them the track replicas. Have them compare and contrast each track. Ask "How many toes are there? What size is it? Are claws present? Any thing special about them (webbing, toe pads, etc.) How are they similar to each other?"
3. Tell them they will be making plaster tracks.
4. Hand out a track mold to each student. Have students work

together to try and figure out what animal track they have (they can use the Animal Tracks of the Great Plains book for a reference).

5. Next, have each student rub petroleum jelly on the inside of the mold so the plaster will not stick.
6. One at a time, have students spoon plaster into their mold. If plaster is not too thick, tracks will dry in about a half an hour. If not, students can take them home next week.
7. Touch each track to see if they are dry and then turn them upside down to gently remove the plaster track from the mold.

Edible Scat Activity

Before the activity:

1. Set up table with ingredients to make scat.
2. Post animals pictures by corresponding ingredients.
3. Make copies of Scat Rap student sheet, one per student.

Procedure

1. Have students define scat (a scientific word for animal poop!)
2. Let students look at the scat replicas. Using their knowledge of food webs and food chains from the Web of Life activity, have students try to figure out what each of the animal's eat.
3. Tell them they will be making edible scat!
4. First, discuss the different diets with the students, herbivore, carnivore, and omnivore. There are five animals represented:

elk, coyote, river otter, raccoon and muskrat. Their scat looks

different because of what types of food they eat.

- a. Muskrats and elk are herbivores and only eat plants and plant materials. Examples are leaves, bark, flowers, grass, twigs, etc.
 - b. Coyotes and river otters are carnivores and eat other animals. They are commonly known as "meat eaters".
 - c. Raccoons are omnivores and eat both plants and animals.
5. At the table, have the students begin to make the scat. **Follow the instructions on the scat recipes sheet found in the binder and the tub.**
 6. When students are finished they may eat their creations!
 7. Ask the students why they need to know about scat... who cares? Can be used for:
 - a. Animal tracking
 - b. Animal disease
 - c. Wildlife viewing
 - d. Hunting
 - e. Animal diets
 - f. Fertilizer
 - g. Burned like firewood
 8. Hand out a copy of the Scat Rap to each student.



SCAT!



Ever wonder what certain animals eat? And what makes their poop look a certain way? Here is your chance to find out!

SCAT! looks at the unconventional world of animal poop. From herbivorous beavers, omnivorous raccoons, or carnivorous bobcats, what an animal eats changes the makeup of its scat.

Herbivores eat plants or plant parts like grass, trees, shrubs, forbs, fruit, leaves, nectar, seeds, etc. Beavers are herbivorous and eat mostly tree bark and cambium, the soft tissue that grows under the bark. Beavers also eat other vegetation like roots, buds, and other water plants. Beaver scat is 1.5-2.5 inches long and contains chips of wood and bark. After only a few days, its consistency becomes sawdustlike and crumbles easily.

Carnivores eat meat. This means that they eat other animals, either living or dead. Bobcats are carnivorous and eat animals like rabbits, squirrels, and mice. Bobcat scat is cylindrical and usually segmented, and may contain parts of the prey it has consumed (like bones or hair). Length ranges between 2 and 6 inches.

Omnivores can eat both plants and animals. Raccoons are omnivorous and opportunistic. Common foods include fruits, nuts, insects, rodents, frogs, and eggs. In rural areas they consume large amounts of corn, and in urban and suburban areas they are often seen rummaging through trashcans. Raccoon scat is tubular and flat on the ends. Raccoons often create “latrines” where many different raccoons deposit their scat in one place.

*Note: Scat found in nature can contain parasites or otherwise harmfully affect humans in some way if handled improperly. Always wear protection and do not handle scat without an adult present.

Scat Recipes

By Nebraska Game and Parks Commission

Animals whose scat we will make:

1. Elk
2. Coyote & Red Fox
3. River Otter
4. Raccoon
5. Muskrat

Ingredients:

Lifesavers	Bone Fragments
Green Shredded Wheat	Plant Material
Regular Shredded Wheat	Fur
Craisins	Berries
Sprinkles	Fish Scales
Cocoa Pebbles	Chunky Poop Parts
Cinnamon	Shine off of Tootsies Roll
Corn Pops	Corn

Elk

Ingredients:

- Tootsie Rolls (5 midgets or 1 long skinny one per person)
- Green food coloring
- Shredded wheat
- Cinnamon

Directions:

- Shredded wheat can be dyed green with food coloring for plant material.
- Soften tootsie rolls in microwave (10 – 15 seconds with wrapper on) - may also put in pocket.
- Cinnamon takes the shine off the tootsie rolls.

Coyote and Red Fox

Ingredients:

- Tootsie Rolls (5 midgets or 1 long skinny one per person)
- Shredded Wheat
- Craisins
- Cocoa pebbles
- Wint-O-Green lifesavers
- Cinnamon

Directions:

- Shredded wheat can be dyed green with food coloring for plant material.
- Cinnamon takes the shine off the tootsie rolls.
- Shredded wheat represents fur; lifesavers represent bone fragments; Craisins represent berries

River Otter

Ingredients:

- Tootsie Rolls (5 midgets or 1 long skinny one per person)
- Shredded Wheat
- Red Food Color (optional)
- Sprinkles
- Cinnamon takes the shine off the tootsie rolls.

Directions:

- Shredded wheat can be dyed with red food coloring to represent shells and crayfish parts; sprinkles represent fish scales
- Soften tootsie rolls in microwave (10 – 15 seconds with wrapper on) - may also put in pocket.
- Cinnamon takes the shine off the tootsie rolls.

Raccoon

Ingredients:

- Tootsie Rolls (5 midgets or 1 long skinny one per person)
- Corn Pops
- Shredded Wheat
- Craisins
- Cocoa Pebbles
- Cinnamon

Directions:

- Soften tootsie rolls in microwave (10 – 15 seconds with wrapper on) - may also put in pocket.
- Cinnamon takes the shine off the tootsie rolls.
- Shredded Wheat represents fur; Corn Pops represent corn; Craisins represents berries

Muskrat

Ingredients:

- Tootsie Rolls (5 midgets or 1 long skinny one per person)
- Green food coloring
- Shredded Wheat
- Cinnamon

Directions:

- Soften tootsie rolls in microwave (10 – 15 seconds with wrapper on) - may also put in pocket.
- Cinnamon takes the shine off the tootsie rolls.
- Shredded Wheat can be dyed green with food coloring for plan material.